Chapter 1

INTRODUCTION

The MICRO ATX AL11 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 RAGE PRO Turbo technology in graphics and ENSONIQ® ES1371 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 support:
  - AMD® K5/K6/K6-2 processors are supported.
  - Intel® Pentium® processor/Pentium® processor with MMX™ technology.
  - Cyrix® 6x86/6x86L/MII are supported.

Chipset
- Aladdin® 5 M1541/M1543C chipset.

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

Cache Memory
- Supports 512K Pipelined Burst SRAM memory.
- Cacheable range 128MB (with external TAG RAM).

Main Memory
- Supports four memory banks using two 168-pin unbuffered DIMM.
- Supports a maximum memory size of 512MB.
- 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 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.

VGA

- ATI® 3D RAGE PRO Turbo
    - Running on AGP BUS.
    - Onboard 8MB SDRAM.
    - 3D Acceleration.
    - AGP 2x mode (133MHz) supports pipelined and sideband protocols.

Switching Regulator

- Provides CPU with voltage from 2.0V to 3.52V.
- Supports VI/O 3.45 for AMD® K6 300 processor.

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 (COM A)
    - 1 parallel port supports SPP/EPP/ECP mode
    - 2 USB ports
    - 1 IrDA connector for SIR.

Sound

- Creative® ES1371
    - High performance on PCI Bus Master.
    - AC97 compliant.
    - 3D audio effects.
    - True Full Duplex Playback
    - Full DOS game compatibility.
    - Special Enhanced 3D sound.
    - Microsoft® Direct Sound 3D support for localized 3D Sound effects.

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.

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.
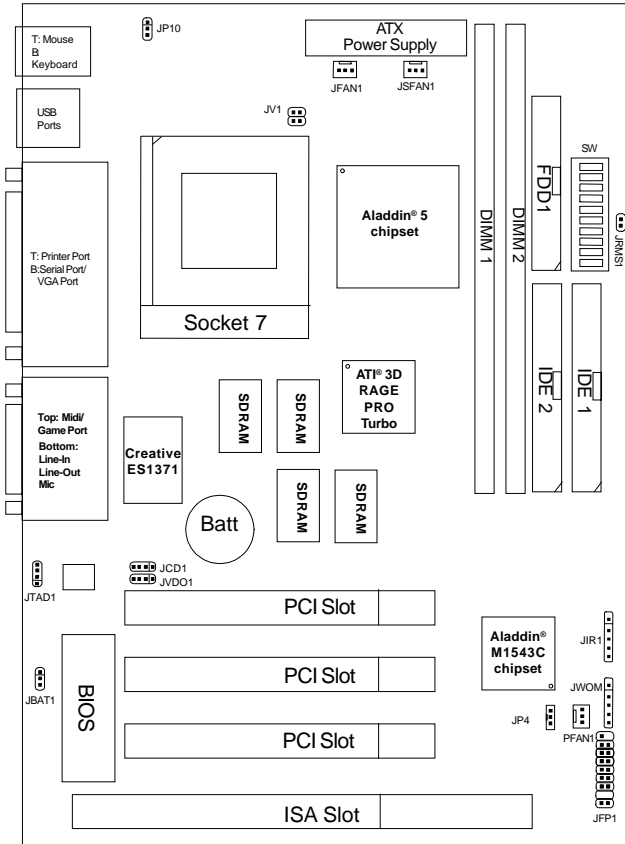
Dimension
- MICRO ATX form factor : 24.4cm(L) x 19.2cm(W) x 4 layers PCB

Mounting
- 6 mounting holes.

1.2 Mainboard Layout

**MS-5182 Micro ATX AL11**

Chapter 2

HARDWARE INSTALLATION

2.1 Central Processing Unit: CPU

The **MICRO ATX AL11** 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 2.1V to 3.5V processors. The mainboard provides a 321-pin ZIF Socket 7 for easy CPU installation, a DIP switch (SW) to set the proper speed for the CPU and (SW) 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.
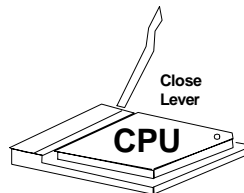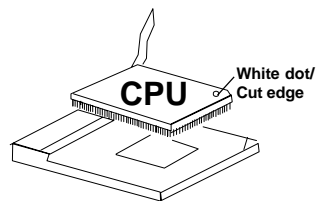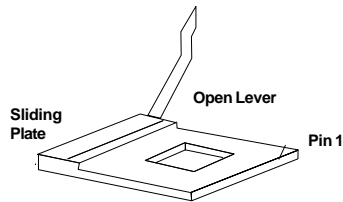
2.1-2 CPU Core Speed Derivation Procedure

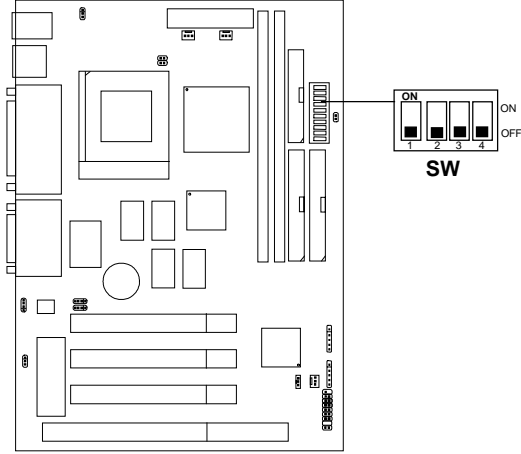1. The DIP Switch SW (8, 9, & 10) is used to adjust the CPU clock frequency.

SW			CPU
8	**9**	**10**	**Clock**
ON	ON	ON	60MHz
OFF	ON	ON	66MHz
OFF	OFF	ON	75MHz
OFF	ON	OFF	83MHz
OFF	OFF	OFF	100MHz
ON	OFF	OFF	95MHz

2. The DIP Switch SW (5, 6, and 7) 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:
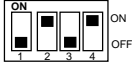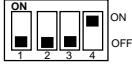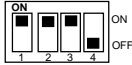
If	CPU Clock	=	66MHz
	Core/Bus ratio	=	3/2
then	CPU core speed	=	Host Clock x Core/Bus ratio
		=	66MHz x 3/2
		=	100MHz
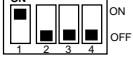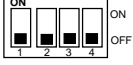
SW			CPU
5	**6**	**7**	**Core/Bus Ratio**
OFF	OFF	OFF	3.5x
OFF	ON	OFF	3x
ON	OFF	OFF	2x
ON	OFF	OFF	2.5x
OFF	OFF	ON	5.5x
OFF	ON	ON	5x
ON	OFF	ON	4x
ON	ON	ON	4.5x

2.1-3 CPU Voltage Setting: SW

V I/O	Vcore	SW		
3.4	3.5			
3.4	3.4			
3.4	3.3			
3.4	3.2			

V I/O	Vcore	SW
3.4	3.1	ON / OFF (1 2 3 4)
3.4	3.0	ON / OFF (1 2 3 4)
3.4	2.9	ON / OFF (1 2 3 4)
3.4	2.8	ON / OFF (1 2 3 4)
3.4	2.7	ON / OFF (1 2 3 4)
3.4	2.6	ON / OFF (1 2 3 4)
3.4	2.5	ON / OFF (1 2 3 4)
3.4	2.4	ON / OFF (1 2 3 4)

V I/O	Vcore	SW
3.4	2.3	
3.4	2.2	
3.4	2.1	
3.4	2.0	

Note: The DIP Switch SW (1, 2, 3, and 4) is used to adjust the CPU voltage setting.

2.1-4 CPU Single/Dual Voltage setting: JV1

This is used to set the CPU voltage from single to dual voltage setting.

JV1
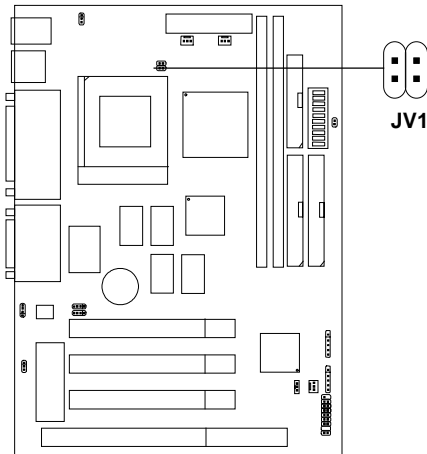
JV1	CPU
	Single Voltage CPU **VI/O = Vcore**
	Dual Voltage CPU **VI/O = 3.45V**

2.1-5 CPU Speed and Voltage Setting: SW 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 (Cyrix**® **Processor), and Table 2.3 (AMD**® **Processor)** for proper setting.
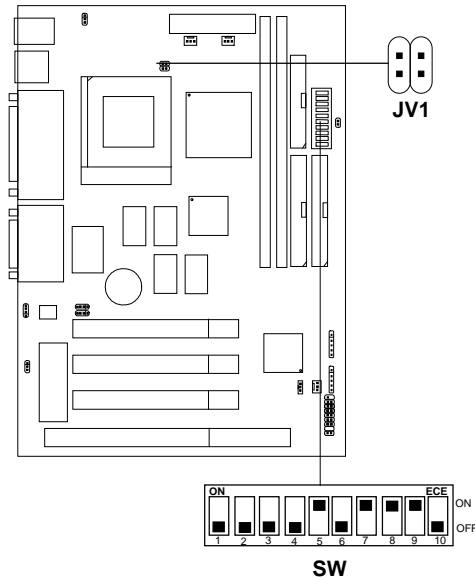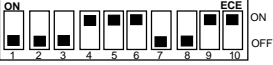
Table 2.1 Intel® Processor

a. Intel® Pentium® Processor

CPU Type	CPU Voltage			CPU Speed
	VI/O	Vcore	JV1	SW
90 MHz	3.38			
100 MHz				
120 MHz				
133 MHz	3.52			
150 MHz				
166 MHz				
180 MHz				
200 MHz				

b. Intel® Pentium® Processor with MMX™ Technology

CPU Type	VI/O	Vcore	JV1	SW
166 MHz				
200 MHz	3.3	2.8		
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 has120MHz core speed in Cyrix® processor. Cyrix® 6x86 processor should always use a more powerful fan (ask vendor for proper cooling fan).
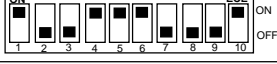
a. Cyrix® 6x86 processor

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

b. Cyrix® 6x86L processor

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

c. Cyrix® 6x86MX Processor

CPU Type	CPU Voltage			CPU Speed
	VI/O	Vcore	JV1	SW
PR200 (75 x 2)	3.4	2.9		*(DIP switch setting)*
PR233 (66 x 3)				*(DIP switch setting)*
(75 x 2.5)				*(DIP switch setting)*
(83 x 2)				*(DIP switch setting)*
PR266 (83 x 2.5)				*(DIP switch setting)*

d. Cyrix® MII processor

CPU Type	CPU Voltage			CPU Speed
	VI/O	Vcore	JV1	SW
PR300 (66x3.5)	3.4	2.9		*(DIP switch setting)*
PR333 (100x2.5)				*(DIP switch setting)*

Note: In case, you encounter a CPU with different voltage, just go to **Section 2.1-3** and look for the proper voltage settings.
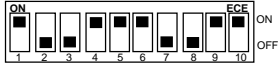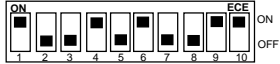
Table 2.3 AMD® Processor

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	SW
PR133				
PR150	3.52			
PR166				

b. AMD® K6 Processor

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

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: JFAN1, JSFAN1 & JPFAN1

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.
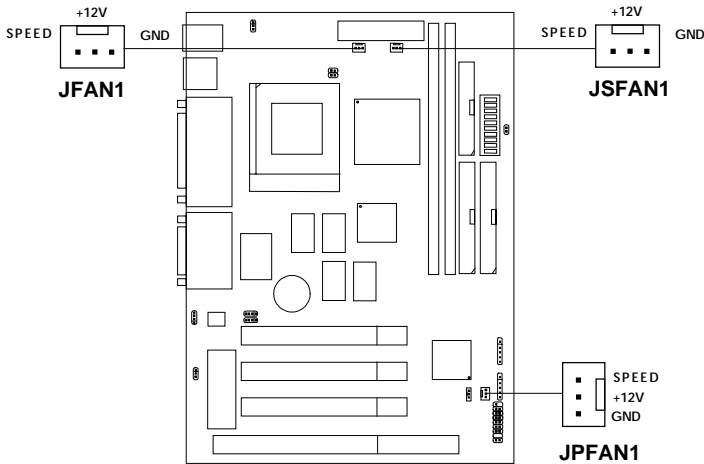
JFAN1:   CPU FAN
JSFAN1: System (chassis) FAN
JPFAN1: Power FAN

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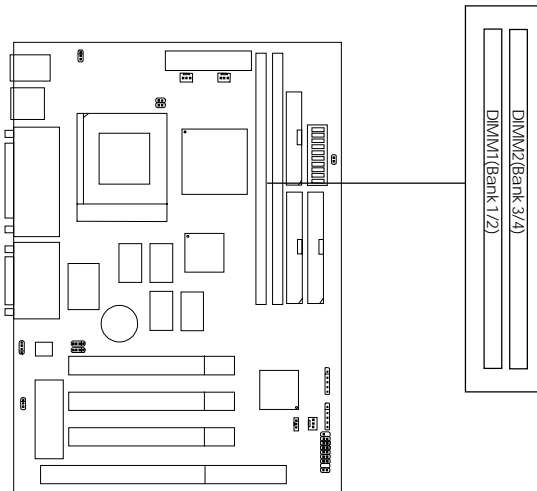
> ⚠ **WARNING!**   **If you use 100 MHz CPU Bus Frequency, only PC100 DIMM Specs. is supported.**

2.2-2 Memory Installation Procedure:

A. How to install DIMM Module

Single Sided DIMM
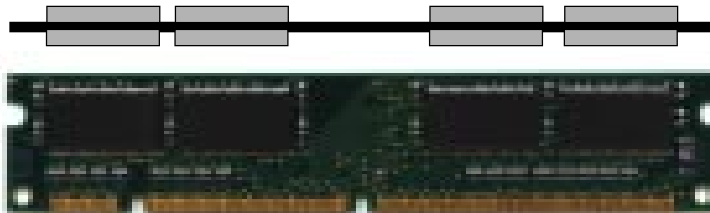
Double Sided DIMM

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.

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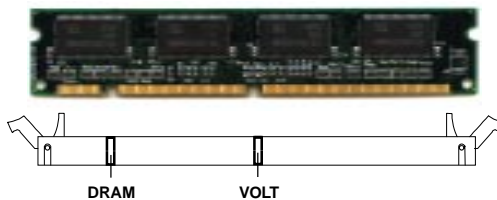
3. The plastic clip at the side of the DIMM slot will automatically close.

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: JFP1

The Power Switch, Reset Switch, Key Lock, Power LED, Speaker and HDD LED are all connected to the JFP1 connector block.
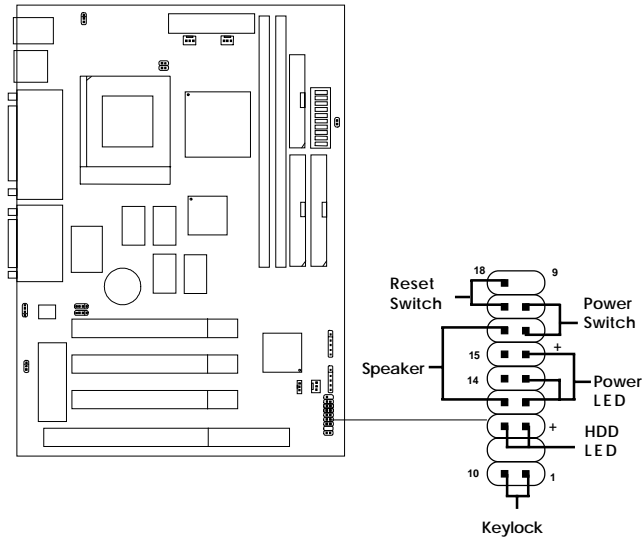
2.3-1 Power Switch

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: FDD1

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.
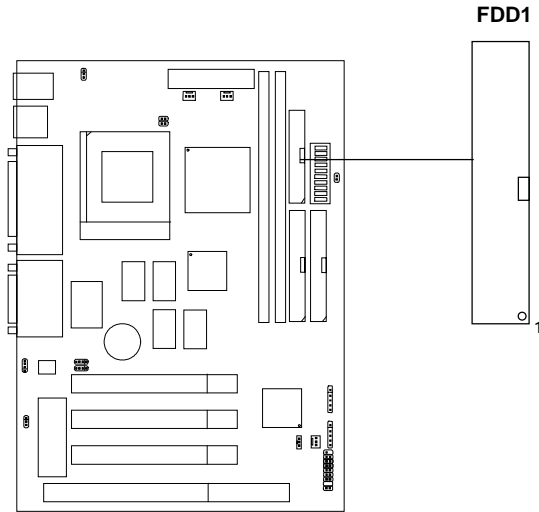
2.5 Hard Disk Connectors: IDE1 & IDE2

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.
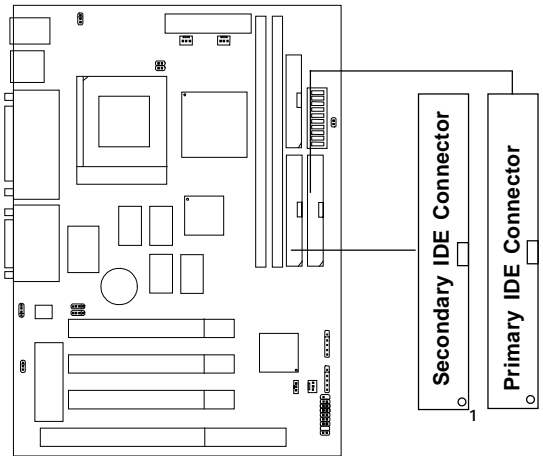
IDE1(Primary IDE Connector)

> 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)**.

**ATX
Power Connector**
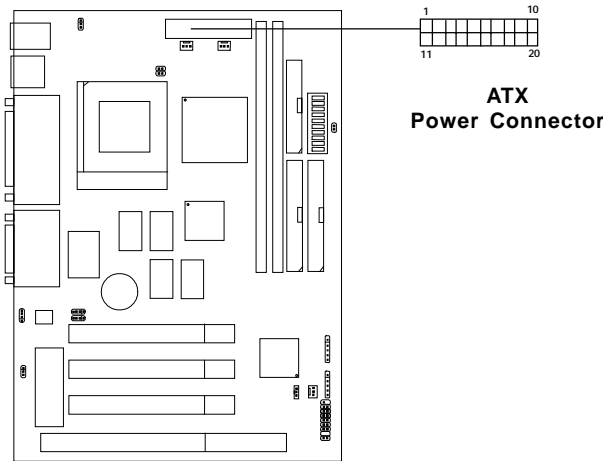
PIN DEFINITION

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 Remote Power On/Off Switch: JRMS1

Connect to a 2-pin push button switch to JRMS1. Push the button switch once, the power supply will change its status from OFF to ON. During ON stage: push once and the system goes to sleep mode; push it for more than 4 seconds will change its status from ON to OFF.

JRMS1
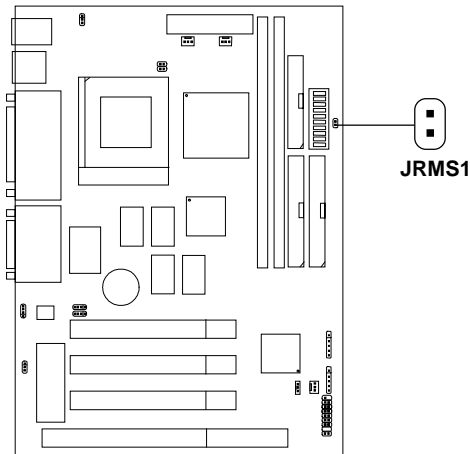
2.8 Serial Port Connector: COM A

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.

COM A
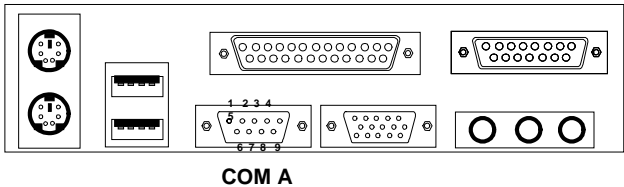
Serial Ports (9-pin Male)

PIN DEFINITION

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

2.9 VGA DB 15 Pin Connector

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

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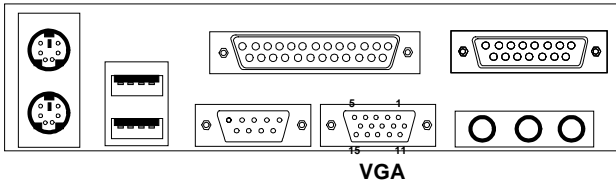
Analog Video Display Connector(DB15-S)	
Pin	**Signal Description**
1	Red
2	Green
3	Blue
4	Not used
5	Ground
6	Ground
7	Ground
8	Ground
9	Not used
10	Ground
11	Not used
12	SDA
13	Horizontal Sync
14	Vertical Sync
15	SCL

2.10 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
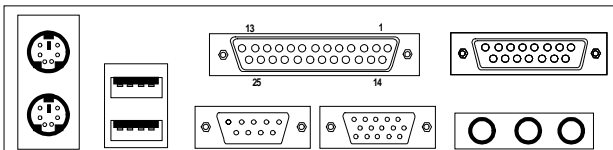
PIN DEFINITION

PIN	SIGNAL	PIN	SIGNAL
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		

2.11 Mouse Connector: JKBMS1

The mainboard provides a standard PS/2® mouse mini DIN connector for
attaching a PS/2® mouse. You can plug a PS/2® mouse directly into this
connector. The connector location and pin definition are shown below:
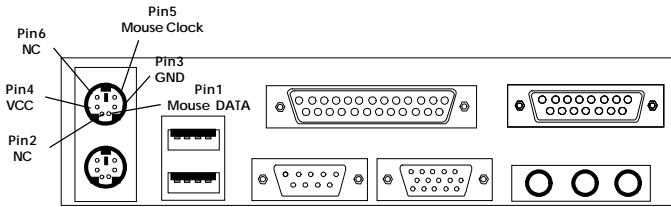
PS/2 Mouse (6-pin Female)

2.12 Keyboard Connector: JKBMS1

The mainboard provides a standard PS/2® keyboard mini DIN connector for
attaching a keyboard. You can plug a keyboard cable directly to this
connector.
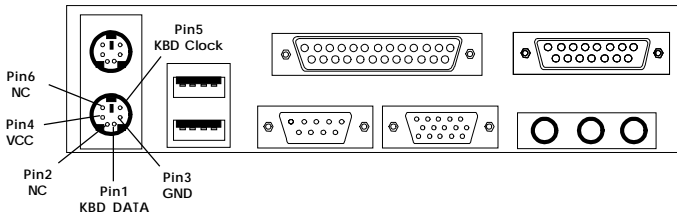
PS/2 Keyboard (6-pin Female)

2.13 Joystick/Midi Connector

You can connect joystick or game pads to this connector.

Joystick/MIDI
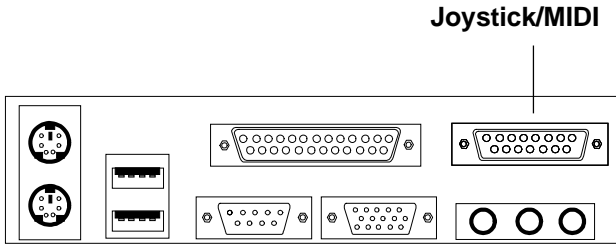
2.14 Audio Port Connectors

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.

Line Out　**Line In**　**Mic**
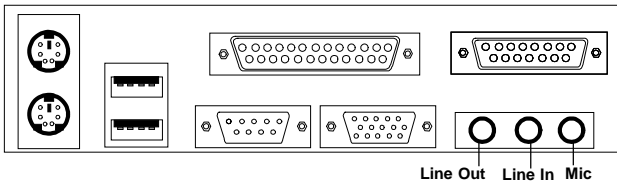
1/8" Stereo Audio Connectors

2.15 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.

USB Port 2

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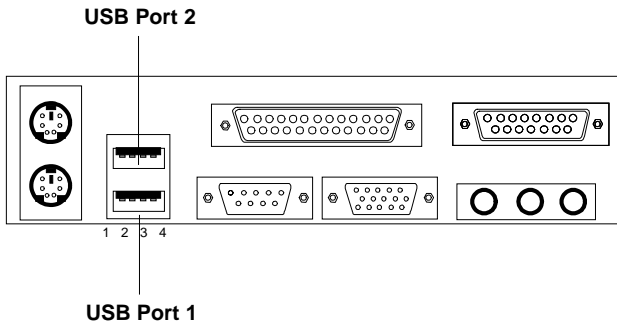
PIN	SIGNAL
1	VCC
2	-Data0
3	+Data0
4	GND

2.16 Clear CMOS Jumper: JBAT1

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 JBAT1 to keep the CMOS data.
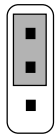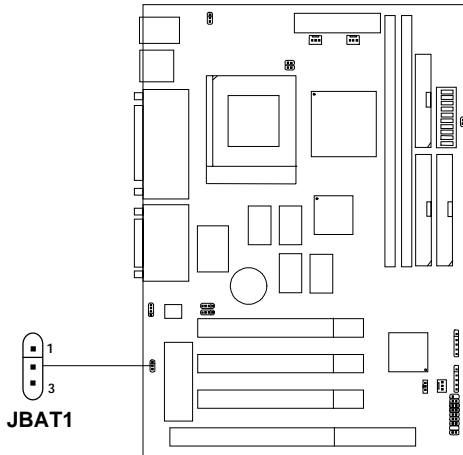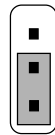
Keep Data   **Clear Data**

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.

2.17 Modem Wake Up Connector: JWOM

The JWOM connector is used with Modem add-on card, which supports the Modem Wake Up function.

JWOM
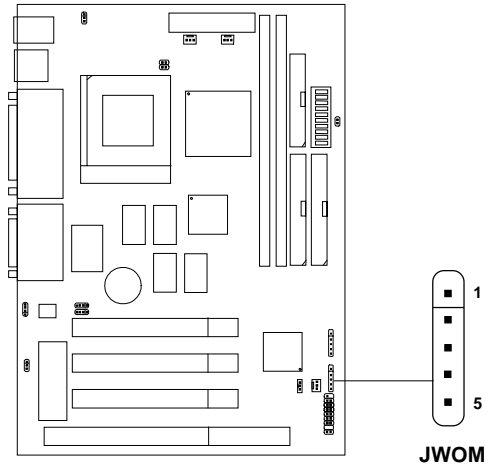
PIN	SIGNAL
1	NC
2	GND
3	RING
4	NC
5	VCC_ON

Note: Modem wake-up signal is active "low".

Note: To be able to use this function, you need a power supply that provides enough power for this feature.
(750 ma power supply with 5V Stand-by)

2.18 Wake-Up on LAN Connector: JP4

The JP4 connector is used with LAN add-on cards, which supports Wake Up on LAN function. To use this function you need to set the "Resume By Ring" to enable at the BIOS Power Management Setup.
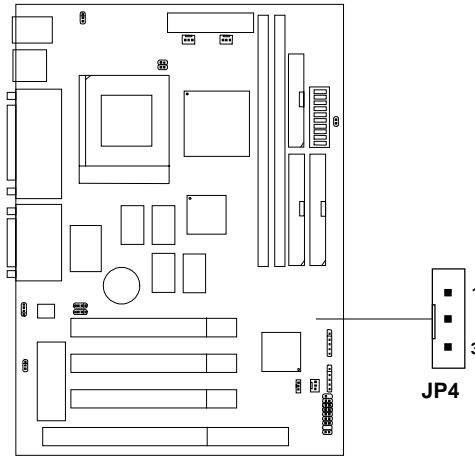
PIN	SIGNAL
1	5VSB
2	GND
3	MP_WAKEUP

Note: LAN wake-up signal is active "high".

Note: To be able to use this function, you need a power supply that provides enough power for this feature.
(750 ma power supply with 5V Stand-by)

2.19 CD Line-In: JCD1

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

Right GND Left

JCD1
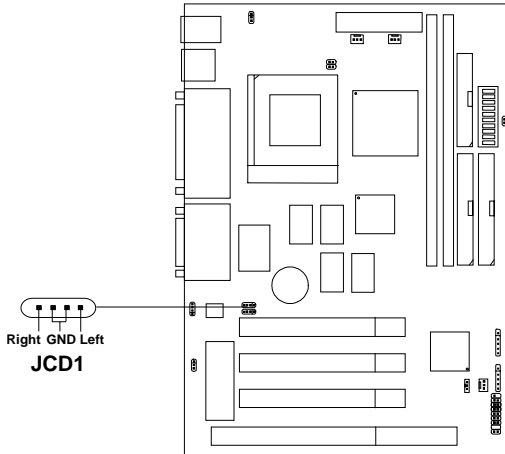
2.20 TV Audio Tuner Line-In: JVDO1

Connect the TV Tuner audio cable provided by the TV Tuner into this connector.
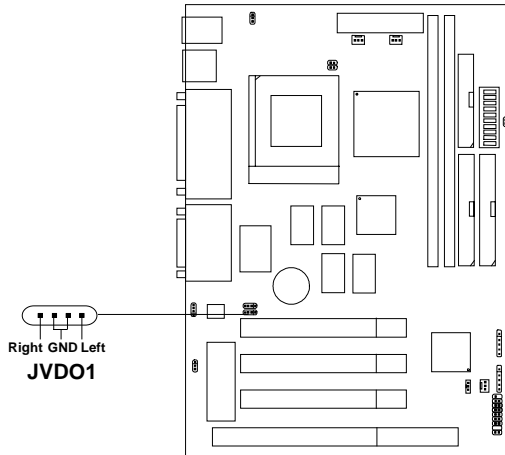
2.21 Internal Voice Modem Connector: JTAD1

This connector is for modem with internal voice connector.
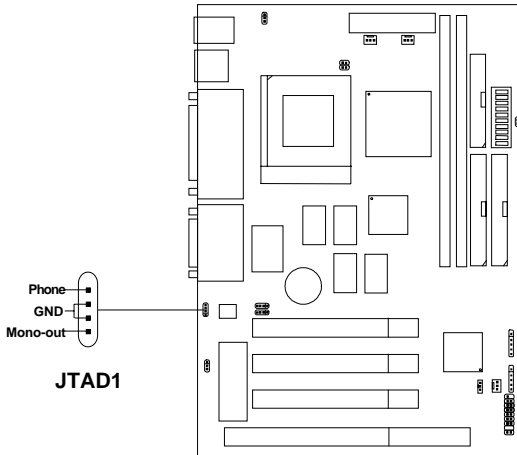
2.22 IrDA Infrared Module Connector: JIR1

The mainboard provides one 5-pin infrared (JIR1) connector for IR modules. This connector is for optional wireless transmitting and receiving infrared module. You must configure the setting through the BIOS setup to use the IR function. FIR and Consumer IR are reserved functions.

1

VCC
NC
IRRX
GND
IRTX

JIR1
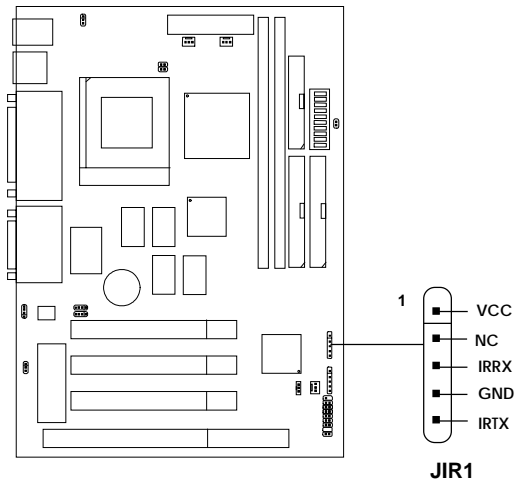
2.23 Keyboard Power On Function: JP10

The JP10 jumper is used for setting the keyboard power on function. This function is provided by the keyboard and PS/2 mouse Wake-up function.

JP10
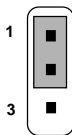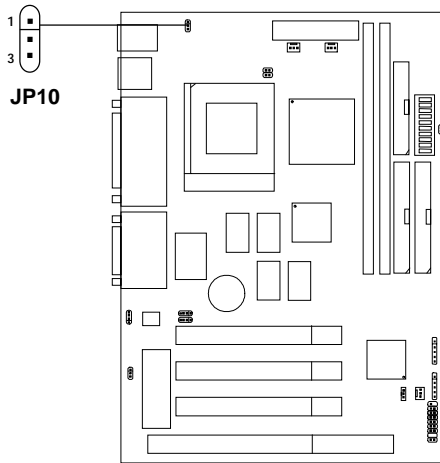
5V (default)
Disable keyboard
power on function
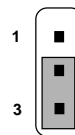
5V_Standby
Enable keyboard
power on function

Note: To be able to use this function, you need a power supply that
provides enough power for this feature.
(750 ma power supply with 5V Stand-by)

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.
A5179MS 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.*

```
 ┌─────────────────────────────────────────────────────┐
 │  AMIBIOS  HIFLEX  SETUP  UTILITIES  -  VERSION  1.20 │
 │  (C)  1998  American  Megatrends,  Inc.  All  Rights │
 │                   Reserved                           │
 ├─────────────────────────────────────────────────────┤
 │                                                      │
 │                Standard  CMOS  Setup                 │
 │                Advanced  CMOS  Setup                 │
 │               Advanced  Chipset  Setup               │
 │               Power  Management  Setup               │
 │               PCI/Plug  and  Play  Setup             │
 │                   Peripheral  Setup                  │
 │               Auto-Detect  Hard  Disks               │
 │                Change  User  Password                │
 │             Change  Supervisor  Password             │
 │      Auto  Configuration  with  Optimal  Settings    │
 │     Auto  Configuration  with  Fail  Safe  Settings  │
 │               Save  Settings  and  Exit              │
 │                 Exit  without  Saving                │
 │                                                      │
 │                                                      │
 ├─────────────────────────────────────────────────────┤
 │                                                      │
 │   Standard CMOS setup for changing time, hard disk type, etc. │
 │                                                      │
 └─────────────────────────────────────────────────────┘
```

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
                                            LBA   Blk   PIO   32Bit
            Type  Size  Cyln  Head  WPcom Sec  Mode  Mode  Mode  Mode
Pri Master :Auto                                                ON
Pri Slave  :Auto                                                ON
Sec Master :Auto                                                ON
Sec Slave  :Auto                                                ON

Boot  Sector  Virus  Protection   Disabled


Month    : Jan-Dec                     ESC:Exit :Sel
Day      : 01-31                       PgUp/PgDn:Modify
Year     : 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
Try Other Boot Devices       Yes         IDE2
Quick Boot                   Disabled    IDE3
BootUp Num-Lock              On          Floppy
Floppy Drive Swap            Disabled    ARMD-FDD
Floppy Drive Seek            Enabled     ARMD-HDD
Floppy Access Control        Normal      CDROM
HDD Access Control           Normal      SCSI
PS/2 Mouse Support           Enabled     Network
Primary Display              VGA/EGA
Password Check               Setup
Boot to OS/2                 No
External Cache               Enabled
System BIOS Cacheable        Enabled
Video BIOS Shadow            Enabled
C800, 16k Shadow             Disabled
CC00, 16k Shadow             Disabled
D000, 16k Shadow             Disabled
D400, 16k Shadow             Disabled    ESC:Exit  :Sel
D800, 16k Shadow             Disabled    PgUp/PgDn:Modify
DC00, 16k Shadow             Disabled    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 systm 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.

Try other Boot Devices

This option sets the boot device, if all the Four Boot Devices failed.

Quick Boot

Set this option to Enabled to permit AMI® BIOS to boot within 8 seconds. This option replaces the old ABOVE 1 MB Memory Test option. The Optimal default setting is Enabled. The Fail-Safe default setting is Disabled.

Boot up Num Lock

When this option is set to Off, AMI® BIOS turns off the Num Lock key when the system is powered on. The end user can then use the arrow keys on both the numeric keypad and the keyboard. The settings are On or Off. The optimal default and Fail-Safe default settings are On.

Floppy Drive Swap

Set this option to Enabled, this will specify that floppy drives A: and B: are swapped. The setting are Enabled and Disabled. The Optimal and Fail-Safe default settings are Disabled.

Floppy Drive Seek

When this option is set to Enabled, AMI® BIOS performs a Seek command on floppy drive A: before booting the system. The settings are Enabled and Disabled. The Optimal and Fail-Safe default settings are Disabled.

Floppy Access Control

This option sets the Floppy to Read-only or Read-Write.

HDD Access Control

This option sets the HDD to Read-only or Read-Write. During Read-only, if you try to write on the HDD, the system will halt.

PS/2® Mouse Support

When this option is set to Enabled, AMI® BIOS supports a PS/2® mouse. The settings are Enabled and Disabled. The Optimal and Fail-Safe default settings are Enabled.

Primary Display

This option configures the primary display subsystem in the computer. The settings are Mono(monochrome), 40CGA, 80CGA, or VGA/EGA. The Optimal and Fail-Safe default settings are VGA/EGA.

Password Check

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

Boot to OS/2

Set this option to Enabled to permit the BIOS to run properly, if OS/2® is to be used with > 64MB of DRAM. The settings are Enabled or Disabled. The Optimal and Fail-safe default settings are Disabled.

External Cache

This option Enabled or Disabled the External Cache.

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.

Enabled(default)   Video shadow is enabled
Disabled   Video shadow is disabled

C800, 16k Shadow/CC00, 16k Shadow/D000, 16K Shadow/ D400, 16k Shadow/D800, 16k Shadow/DC00, 16K Shadow

These options specify how the contents of the adaptor ROM named in the option title are handled. The ROM area that is not used by ISA adapter cards will be allocated to PCI adapter cards. The settings are;

Disabled - The specified ROM is not copied to RAM.
Cache - The contents of the ROM area are not only copied from ROM to RAM for faster execution, it can also be written to or read from cache memory.
Shadow - The contents of the ROM area are copied from ROM to RAM for faster execution.

The Optimal and Fail-Safe default settings are 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 Function                     Enabled      Available Options:
  USB Keyboard Legacy Support      Disabled        Disabled
  Ext. Tag SRAM Width              Auto            Enabled
  SDRAM Burst X-1-1-1-1-1-1-1      Enabled
  DRAM Timing                      Normal
  Pipe Function                    Enabled
  Gated Clock                      Disabled
  Graphics Aperture Size           64
  Primary Frame Buffer             Enabled
  VGA Frame Buffer                 Enabled
      Data Merge                   Disabled
  Passive Release                  Enabled
  ISA Line Buffer                  Enabled
  Delay Transaction                Disabled
  AT Bus Clock                     Auto
  System Hardware Control          Enabled
  Onboard AGP                      Enabled
  Onboard Audio                    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 Function
Set this option to Enable or Disable the on-chip USB controller. The Optional and Fail-Safe default settings are Disabled.

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

Ext. Tag SRAM Width
During 8 bits, the cacheable range is 128MB. During 10 bits, the cacheable range is 512MB.

Note: You can only choose 8 bits since an external TAG RAM is used. 10 bits is used for internal TAG RAM which is reserved for future use.

SDRAM Burst X-1-1-1-1-1-1-1
During Enabled, this will improve the SDRAM module burst function. Some SDRAM module doesn't support this function, so this must be set to Disabled.

DRAM Timing
Choose DRAM timing for customized setup.

Pipe Function
Set this option to Enable the pipeline from the PCI bus to system memory. The settings are Enabled or Disabled. The Optimal and Fail-Safe Default settings are Enabled.

Gated Clock
Set to Enable, if there's no PCI Interface cycle. The PCI Interface will be automatically shutdown.

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.

VGA 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 processors 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 set the processor memory location A000 and B000 segment as USWC memory type.

Data Merge

During Enabled, this will use Burst Cycle for Data Transfer.

Passive Release

During Enabled, this will allow the chipset to use passive release while transferring control information or data for transaction. During Disabled, chipset will perform PCI accesses without using passive release.

ISA Line Buffer

When an ISA/DMA master reads from the PCI memory, the M1543 chipset prefetches 8 bytes of data into the line buffer. Default settings is Enabled.

Delay Transaction

During Enabled, the chipset delay transaction mechanism will enable the chipset to target the PCI transaction. A read cycle from Host to PCI is immediately retrieved due to any pending PCI to DRAM cycle. During Disabled, a read cycle from Host to PCI is waited until time-out due to any pending PCI to DRAM cycle.

AT Bus Clock

This is used to set the ISA Bus Clock Frequencies.

System Hardware Control

Choosing Enabled will allow you to select the Onboard AGP and Onboard Audio.

Onboard AGP

Choosing Enabled will allow the system to use the onboard AGP VGA controller. Choose Disabled, when using add-on PCI VGA card.

Onboard Audio

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

3.5 Power Management Setup

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

```
         AMIBIOS  SETUP  -  POWER  MANAGEMENT  SETUP
      (C) 1998 American Megatrends, Inc. All Rights
                         Reserved

  Power Management / APM          Enabled      Available  Options:
  Green Monitor Power State       Off          Disabled
  Video Power Down Mode           Stand By     Enabled
  Hard Disk Power Down Mode       Disabled
  Standby Time Out                Disabled
  Suspend Time Out                Disabled
  Monitor Pri-HDD                 Yes
  Monitor Sec-HDD                 No
  Power Button Function           Soft Off
  Ring/LAN Resume From Soft-Off   Disabled
  RTC Alarm Resume                Disabled
  RTC Alarm Date                  15
  RTC Alarm Hour                  12
  RTC Alarm Minute                50
  RTC Alarm Second                30



                                               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 Power Management Setup, press <ESC> to go back to the main menu.

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.

Standby Time Out

This option specifies the length of a period of system inactivity while in Full power on state. When this length of time expires, the computer enters Standby power state. The settings are Disabled, 1 min, 2 min, 3 min, 4 min, 5 min, 6 min, 7 min, 8 min, 9 min, 10 min, 11 min, 12 min, 13 min, 14 min or 15 min. The Optimal and Fail-Safe default settings are Disabled.

Suspend Time Out

This option specifies the length of a period of system inactivity while in Standby state. When this length of time expires, the computer enters Suspend power state. The settings are Disabled, 1 min, 2 min, 3 min, 4 min, 5 min, 6 min, 7 min, 8 min, 9 min, 10 min, 11 min, 12 min, 13 min, 14 min or 15 min. The Optimal and Fail-Safe default settings are Disabled.

Monitor Parallel Port/Monitor Serial Port/Monitor Floppy/ Monitor VGA/Monitor Audio/Monitor Pri-HDD/Monitor Sec-HDD

When set to Yes, these options enable event monitoring on the specified hardware interrupt request line. If set to Yes and the computer is in a power saving state, AMI® BIOS watches for activity on the specified IRQ line. The computer enters the full on power state if any activity occurs.

AMI® BIOS reloads the Standby and Suspend timeout timers if activity occurs on the specified IRQ line.

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.

Ring Resume from Soft-Off

During Disabled, the system will ignore any incoming call from the modem. During Enabled, the system will boot up if there's an incoming call from the modem.

Note: If you have change the setting, you must let the system boot up until it goes to the operating system. Then, power off the system. This function will work the next time you power on.

RTC Alarm Resume

This function is for setting the Date, Hour, Minute, and Second for your computer to boot up. During Disabled, you cannot use this function. During Enabled, Choose the Date, Hour, Minute, and Second:

RTC Alarm Date   Choose which day the system will boot up.
RTC Alarm Hour   Choose which hour the system will boot up.
RTC Alarm Minute   Choose which minute the system will boot up.
RTC Alarm Second   Choose which second the system will boot up.

Note: If you have change the setting, you must let the system boot up until it goes to the operating system. Then, power off the system. This function will work the next time you power on.

3.6 PCI/Plug and Play Setup

1. Press <ENTER> on "PCI/Plug and Play Setup" of the main menu screen.

```
         AMIBIOS  SETUP  -  PCI/PLUG  AND  PLAY  SETUP
        (C) 1998 American Megatrends, Inc. All Rights
                         Reserved

  Plug and Play Aware O/S          No       Available Options:
  Clear NVRAM on Every Boot        No       No
  PCI Latency Timer (PCI Clocks)   64       Yes
  Primary Graphics Adapter         PCI
  PCI VGA Palette Snoop            Disabled
  OffBoard PCI IDE Card            Auto
  OffBoard PCI IDE Primary IRQ     Disabled
  OffBoard PCI IDE Secondary IRQ   DIsabled
  Assign IRQ to PCI VGA            Yes
  PCI Slot1 IRQ Priority           Auto
  PCI Slot2 IRQ Priority           Auto
  PCI Slot3 IRQ Priority           Auto
  DMA Channel 0                    PnP
  DMA Channel 1                    PnP
  DMA Channel 3                    PnP
  DMA Channel 5                    PnP
  DMA Channel 6                    PnP
  DMA Channel 7                    PnP       ESC:Exit  :Sel
  IRQ3                             PCI/PnP   PgUp/PgDn:Modify
  IRQ4                             PCI/PnP   F2/F3:Color
```

```
  IRQ5                             PCI/PnP
  IRQ7                             PCI/PnP
  IRQ9                             PCI/PnP
  IRQ10                            PCI/PnP
  IRQ11                            PCI/PnP
  IRQ12                            PCI/PnP
  IRQ14                            PCI/PnP
  IRQ15                            PCI/PnP
```

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 PCI/Plug and Play Setup, press <ESC> to go back to the main menu.

Description of the item on screen are as follows:

Plug and Play Aware O/S
Set this option to Yes if the operating system in this computer is aware of and follows the Plug and Play specification. Currently, only Windows® 95 and Windows® 98 are PnP-aware. The settings are Yes or No. The Optimal and Fail-Safe default settings is No.

Clear NVRAM on Every Boot
During Enabled, this option will reset the NVRAM on every boot.

PCI Latency Timer (PCI Clocks)
This option specifies the latency timings (in PCI clocks) for all PCI devices on the PCI bus. The settings are 32, 64, 96, 128, 160, 192, 224 or 248. The Optimal and Fail-Safe default settings are 64.

PCI VGA Palette Snoop
When this option is set to Enabled, multiple VGA devices operating on different buses can handle data from the CPU on each set of palette registers on every video device. Bit 5 of the command register in the PCI device configuration space is the VGA Palette Snoop bit (0 is disabled). For example, if there are two VGA devices in the computer (one PCI and ISA) and the Bit settings are:

Disabled - Data read and written by the CPU is only directed to the PCI VGA device's palette registers.

Enabled - Data read and written by the CPU is directed to both the PCI VGA device's palette registers and the ISA VGA device palette registers, permitting the palette registers of both devices to be identical.

This option must be set to Enabled if an ISA adapter card requires VGA palette snooping. The settings are Enabled or Disabled. The Optimal and Fail-Safe default settings are Disabled.

Offboard PCI IDE Card

This option specifies if an offboard PCI IDE controller adapter card is installed in the computer. You must specify the PCI expansion slot on the mainboard where the offboard PCI IDE controller is installed. If an offboard PCI IDE controller is used, the onboard IDE controller is automatically disabled. The settings are Auto(AMI® BIOS which automatically determines where the offboard PCI IDE controller adaper card is installed), Slot1, Slot2, Slot3 or Slot4. The Optimal and Fail-Safe settings are Auto.

If an offboard PCI IDE controller adapter card is installed in the computer, you must also set the Offboard PCI IDE Primary IRQ and Offboard PCI IDE Secondary IRQ options.

Offboard PCI IDE Primary IRQ/
Offboard PCI IDE Secondary IRQ

These options specify the PCI interrupt used by the Primary (or Secondary) IDE channel on the offboard PCI IDE controller. The settings are Disabled, Hardwired, INTA, INTB, INTC or INTD. The Optimal and Fail-Safe default settings are Disabled.

Assign IRQ to PCI VGA

Choose the IRQ to be assigned to the PCI VGA display adapter card. The Optimal and Fail-Safe default setting is No.

PCI Slot1 IRQ Priority/PCI Slot2 IRQ Priority/PCI Slot3 IRQ Priority/PCI Slot4 IRQ Priority

These options specify the priority IRQ to be used for any PCI devices installed in the PCI expansion slots 1 through 4. The settings are Auto(AMI® BIOS which automatically determines the priority IRQ), (IRQ) 3, 4, 5, 7, 9, 10, or 11. The Optimal and Fail-Safe default settings are Auto.

DMA Channel 0/1/3/5/6/7

These options specify the bus that the specified DMA channel is using. These options allow you to reserve DMAs for legacy ISA adapter cards.

These options determine if AMI® BIOS should remove a DMA from the available DMAs passed to devices that are configurable by the system BIOS. The available DMA pool is determined by reading the ESCD NVRAM. If more DMAs must be removed from the pool, the end user can use these options to reserve the DMA by assigning an ISA/EISA setting to it.

IRQ3/IRQ4/IRQ5/RQ7/IRQ9/IRQ10/IRQ11/IRQ14/IRQ15

These options specify the bus that the specified IRQ line is used on. These options allow you to reserve IRQs for legacy ISA adapter cards.

These options determine if AMI® BIOS should remove an IRQ from the pool of available IRQs passed to devices that are configurable by the system BIOS. The available IRQ pool is determined by reading the ESCD NVRAM. If more IRQs must be removed from the pool, the end user can use these options to reserve the IRQ by assigning an ISA/EISA setting to it. Onboard I/O is configured by AMI® BIOS. All IRQs used by onboard I/O are configured as PCI/PnP. If all IRQs are set to ISA/EISA and IRQ14 and 15 are allocated to the onboard PCI IDE, IRQ9 will still be available for PCI and PnP devices, because at least one IRQ must be available for PCI and PnP devices. The settings are ISA/EISA or PCI/PnP. The Optimal and Fail-Safe default settings are IRQ3 through 7 are ISA/EISA. The Optimal and Fail-Safe default setting is PCI/PnP.

3.7 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                    Auto        Available  Options:
OnBoard  Serial  Port1          3F8H/COM1   Enabled
Onboard  Serial  Port2          Disabled    Disabled
  Serial  Port2  Mode           N/A
  Serial  Port2  DMA            N/A
  IR  Transceiver  Module  Type N/A
  IR  Half-Duplex  Time-Out     N/A
OnBoard  Parallel  Port         378H
  Parallel  Port  Mode          Normal
  EPP  Version                  N/A
  Parallel  Port  IRQ           7
  Parallel  Port  DMA  Channel  N/A
Keyboard  Power  ON             Disabled
Hotkey  Select                  N/A
Onboard  IDE                    Both



                                            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/Onboard Serial Port 2

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:

Onboard parallel port set at	Parallel Port IRQ
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.

Chapter 4

ATI® 3D RAGE PRO TURBO VGA DRIVER

1. Overview

The ATI® 3D 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

- Supports 2M or 4M SGRAM.
- Supports AGP 2X BUS Up to 133MHz.
- Complete 3D primitive support: points, lines, triangles, strips, and
  quadrilaterals.
- 4KOn-chip Texture Cache.
- 16-bit Z buffer.

Note: Before installing the ATI® 3D RAGE PRO Turbo driver:
  - Install the USB Supplement (provided by Windows® 95 CD/Diskette).
  - Install ALI AGP Driver (provided in the CD-ROM)

1.2 System Requirements

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

Computer	Intel® Pentium® processor with MMX™ technology, AMD® K5/K6/K6-2 processor, and Cyrix® 6x86/6x86L/6x86MX processor or higher
Monitor	VGA Support, mimimum 640x480 resolution
Operating system	DOS 5.0 or higher, Windows® 95, Windows® NT 3.51 or 4.0, or OS/2®
CD-ROM	Double Speed or Higher
Chipset	ATI® 3D RAGE PRO Turbo
VGA BIOS	Version 1.01 or Higher

2. ATI® 3D 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 PC-cillin 98 and bus master driver. Just click the button for automatic installation for 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 Display 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 "ATI Installation" icon.
Step 4: This will show an ATI installation menu.
Step 5: Click on "Display Drivers".
Step 6: Click "OK".
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 **yes** to restart.
Step 9: After restarting, Windows® 95/98 will show a new display setting.

2.1-2 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, 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.

2.1-3 ATI Video Player for Windows® 95/98

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 "ATI Installation" icon.

Step 4: This will show an ATI installation menu.

Step 5: Click on "ATI Video Player".

Step 6: This will show "ATI Video Player Setup" icon.

Step 7: Click on "Finish".

Step 8: This will copy the necessary files into the hard drive.

Step 9: After restarting, ATI setup is completed.

Note: Xing Software MPEG is incompatible with Windows® 95.

2.2 Windows® NT 4.0

You need to install Windows® NT "Service Pack 3", before you can 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 succesfully 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 wasa 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 5

CREATIVE® ES1371 AUDIO DRIVER

1. Overview

The Creative® ES1371 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.

Computer	Intel® Pentium® II processor or higher
Operating system	DOS 5.0 or higher, Windows® 95, Windows® NT 3.51 or 4.0, or OS/2®
CD-ROM	Double Speed or Higher
Chipset	Creative® ES1371

2. Audio Driver Setup

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 PC-Cillin 98 and Bus master driver. Just click the button for automatic installation for audio 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 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 "ENSONIQ AudioPCI" 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.

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\Ensoniq\AudioPCI\NT40**
Step 8:   Click **OK**.
Step 9:   Click **OK**.
Step 10: A message will appear stating that the drivers were
                  succesfully 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\Ensoniq\AudioPCI\Docs\Manual.doc