Chapter 1

INTRODUCTION

The MICRO ATX VI16 mainboard is a high-performance all-in-one system mainboard. This mainboard supports Intel® Pentium® processor/Pentium® processor with MMX™ technology, Cyrix®/IBM® 6x86/6x86L/6x86MX/MII, and AMD® K6/K6-2/K6-III processors.

The mainboard uses the highly integrated Apollo MVP4. The Apollo MVP4 is a PC Socket-7 system logic North Bridge with integrated 2D/3D Graphics Accelerator. The core logic portion of the chip is based on the popular 100MHz VIA Apollo MVP3 chipset with enhanced features and graphics accelerator based on the Cyber9398DVD from Trident Microsystems. The VT82C686A Super I/O PCI integrated Peripheral Controller (PSIPC) is a high integration, high performance, power efficient and high compatibility device that supports Intel and non-Intel based processors plus PCI bus bridge functionality to make a complete Microsoft PC98-compliant PCI/ISA system. The VT82C686A supports PCI-to-ISA bus controller, four USB ports, dual bus-master IDE with Ultra DMA33/66, AC97 Basic Audio, System Hardware Monitoring, and integrated "Super I/O functionality".

This Mainboard with Apollo MVP4 coupled with VT82C686A is a ideal performance energy efficient, and highly integrated computer systems.

1.1 Mainboard Features

CPU
● Socket 7 supports Intel® Pentium® processor with MMX™ technology.
● The Cyrix® 6x86/6x86L/6x86MX/MII and AMD® K6/K6-2/K6-III proces-
  sors are also supported.

Chipset
● VIA® VT82C501(MVP4) chipset. (North bridge)
  - support 66/100MHz FSB
  - integrated AGP 2D/3D Graphics Accelerator
  - support PC66/PC100 SDRAM memory module
  - 493 BGA package
● VIA® VT82C686A chipset. (South bridge)
  - PCI Super I/O Integrated
  - integrated SoundBlaster/Direct Sound AC97 Audio
  - UltraDMA-33/66
  - 352 BGA package

FSB (Front Side Bus)
● 66/75/83.3/95/100MHz clocks are supported.

Main Memory
● Supports a maximum memory size of 512MB.
● Supports four memory banks using two 168-pin DIMM sockets.
● Supports 3.3v SDRAM.

Slots
● One AMR (Audio Modem riser) slot and one PTI (PanelLink TV-Out
  Interface) slot.
● Three 32-bit Master PCI Bus slots and one 16-bit ISA bus slot. (wherein
  one PCI/ISA is shared)
● Supports 3.3v/5v PCI bus Interface.

On-Board IDE
- An IDE controller provides IDE HDD/CD-ROM with PIO, Bus Master and UltraDMA-33/66 operation modes.
- Can connect up to four IDE devices.

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.
    - 1 AMR
    - 1 VGA Port
    - 1 PTI

Video
- MVP4 chip integrated
- AGP 2D/3D Graphics

Audio
- chip integrated
- DirectSound AC97 Audio

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: 24cm(L) x 19.2cm(W) x 4 layers PCB
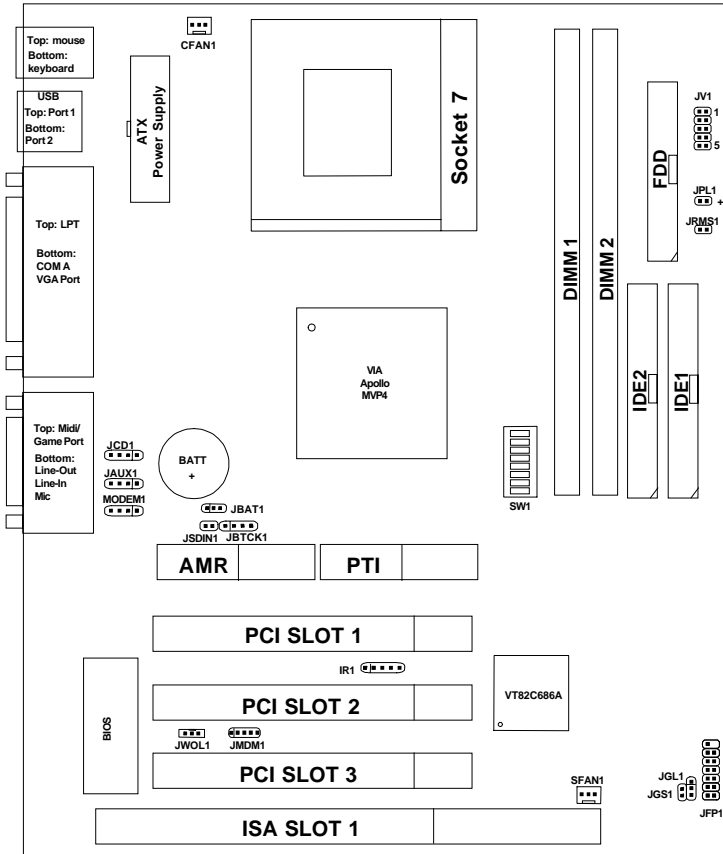
Mounting
- 6 mounting holes.

System Hardware Monitor (optional)
- CPU Fan Revolution Detect
- CPU Fan Control (the fan will automatically stop when the system enters suspend mode)
- System Voltage Detect
- CPU Overheat Warning.
- Display Actual Current Voltage

Other Features
- LAN Wake-Up
- Internal/External Modem Wake-Up

1.2 Mainboard Layout


MS-5187 MICRO ATX VI16 Mainboard

Chapter 2

## Hardware Installation

2.1 Central Processing Unit: CPU

The **Micro ATX VI16** mainboard operates with **Intel® Pentium® processor/ Pentium® processor w/MMX™ technology**, **Cyrix®/IBM 6x86/6x86L/ 6x86MX/MII**, **and AMD® K6/K6-2/K6-III** processors. It could operate with 2.2V to 3.2V processors. The mainboard provides a 321-pin ZIF Socket 7 for easy CPU installation. The CPU should always have a cooling fan attached to prevent overheating.

2.1-1 CPU Installation Procedures

1. Pull the lever sideways away from the socket. Then raise the lever up to a 90-degree angle.

Sliding Plate   Open Lever   Pin 1
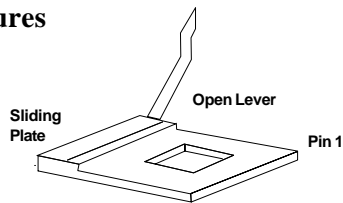
2. Locate Pin 1 in the socket and look for the white dot or cut edge in the CPU. Match Pin 1 with the white dot/cut edge. Then, insert the CPU. It should insert easily.

CPU   White dot/ Cut edge
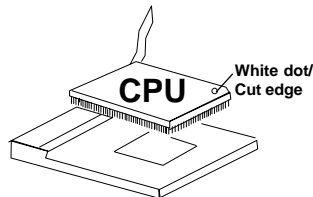
3. Press the lever down to complete the installation.

Close Lever   CPU
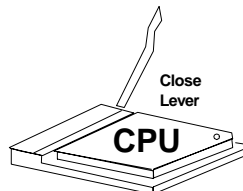
2.1-2   CPU Core Speed Derivation Procedure

1. The DIP Switch SW1 (1, 2, and 3) are 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	=	3.5
then	CPU core speed	=	Host Clock x Core/Bus ratio
		=	66MHz x 3.5
		=	233MHz

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

2. The DIP Switch SW1 (5, 6, 7, and 8) are used to adjust the CPU clock frequency.

SW1				Clock
5	6	7	8	CPU
OFF	OFF	OFF	ON	66
ON	OFF	OFF	OFF	75
OFF	ON	OFF	ON	83.3
OFF	ON	ON	OFF	95
OFF	ON	ON	ON	100

2.1-3 Processor Voltage Setting

The jumper Switch JV1 (1-5) is used to set the processor Vcore voltage setting.
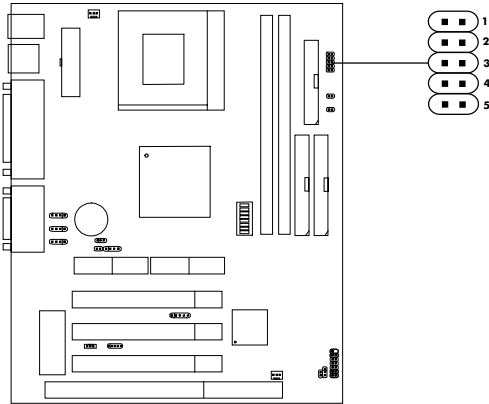
JV1					
1	**2**	**3**	**4**	**5**	**Vcore**
OPEN	SHORT	OPEN	OPEN	OPEN	2.2
SHORT	SHORT	OPEN	OPEN	OPEN	2.3
OPEN	OPEN	SHORT	OPEN	OPEN	2.4
OPEN	OPEN	OPEN	SHORT	OPEN	2.8
SHORT	OPEN	OPEN	SHORT	OPEN	2.9
OPEN	OPEN	SHORT	SHORT	OPEN	3.2

Note: Always consult vendor for proper CPU specification, before setting the processor voltage (Vcore/Vio). Improper setting may damage the processor and other components.

2.1-4 Fan Power Connectors: CFAN1/SFAN1

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 must use a
specially designed fan with speed sensor to take advantage of this function.
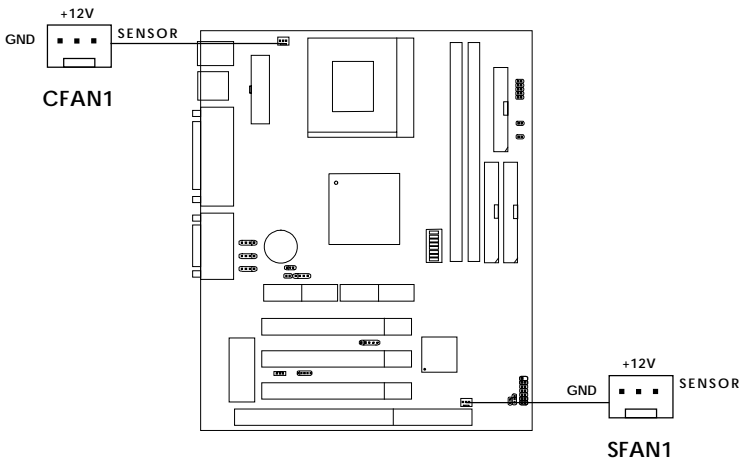
CFAN1: Processor Fan
SFAN1: System Fan

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: **1.** Always consult vendor for proper CPU cooling fan.
        2. CPU FAN supports the FAN control. You can install PC Alert
        utility. This will automatically control the CPU FAN Speed according
        to the actual CPU temperature.

2.1-5 CPU Speed and Voltage Setting: SW1, JV1

To adjust the 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® processors)**, **Table 2.2 (Cyrix® processors)** and **Table 2.3 (AMD® processors)** for proper setting.

JV1

SW1
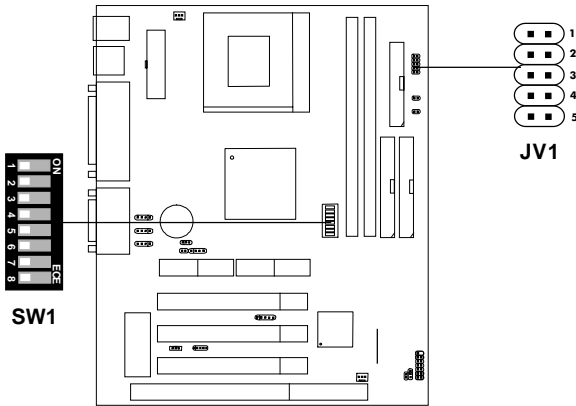
Table 2.1 Intel® processors

Intel® Pentium® processors with MMX™ technology
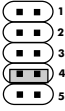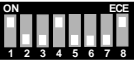
CPU Type	CPU Speed & Voltage			
	VI/O	Vcore	JV1	SW1
166MHz	3.3	2.8		
200MHz				
233MHz				

Note: If 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® processors

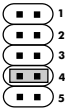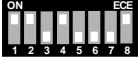Cyrix® 6x86 processor uses PR to rate the speed of their processors based on Intel® Pentium® processor core speed. For example PR150 (120MHz) has 150MHz core speed of Intel® Pentium® processor but has 120MHz core speed in Cyrix®. Cyrix® 6x86 processor should always use a more powerful fan (ask vendor for proper cooling fan).
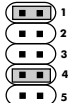
Cyrix® 6x86/6x86L processors

CPU Type	CPU Speed & Voltage			
	VI/O	Vcore	JV1	SW1
6x86L PR166	3.3	2.8		
6x86L PR200				

Cyrix® 6x86MX Processor

CPU Type	CPU Voltage			CPU Speed
	VI/O	Vcore	JV1	SW1
PR200 (66 x 2.5)	3.3	2.9		ON ... ECE 1 2 3 4 5 6 7 8
PR233 (75 x 2.5)				ON ... ECE 1 2 3 4 5 6 7 8
(66 x 3)				ON ... ECE 1 2 3 4 5 6 7 8
(83 x 2)				ON ... ECE 1 2 3 4 5 6 7 8
PR266 (75 x3)				ON ... ECE 1 2 3 4 5 6 7 8
(66 x 3.5)				ON ... ECE 1 2 3 4 5 6 7 8
(83 x 2.5)				ON ... ECE 1 2 3 4 5 6 7 8
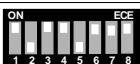
Cyrix® MII Processor

CPU Type	CPU Voltage			CPU Speed
	VI/O	Vcore	JV1	SW1
PR300 (66 x 3.5)	3.3	2.9		ON ... ECE 1 2 3 4 5 6 7 8
(75 x 3)				ON ... ECE 1 2 3 4 5 6 7 8
PR333 (83 x 3)				ON ... ECE 1 2 3 4 5 6 7 8

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

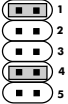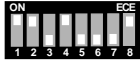**Table 2.3 AMD® Processor**

AMD® K6/K6-2/K6-3 Processor

CPU Type	CPU Voltage			CPU Speed
	VI/O	Vcore	JV1	SW1
166MHz	3.3	2.9	JV1 1–5	ON ... ECE 1 2 3 4 5 6 7 8
200MHz				ON ... ECE 1 2 3 4 5 6 7 8
233MHz	3.3	3.2	JV1 1–5	ON ... ECE 1 2 3 4 5 6 7 8
266MHz	3.3	2.2	JV1 1–5	ON ... ECE 1 2 3 4 5 6 7 8
300MHz				ON ... ECE 1 2 3 4 5 6 7 8
K6-2 300MHz				ON ... ECE 1 2 3 4 5 6 7 8
K6-2 333MHz				ON ... ECE 1 2 3 4 5 6 7 8
K6-2 350MHz				ON ... ECE 1 2 3 4 5 6 7 8
K6-2 380MHz				ON ... ECE 1 2 3 4 5 6 7 8
K6-2 400MHz				ON ... ECE 1 2 3 4 5 6 7 8
K6-2 450MHz	3.3	2.4	JV1 1–5	ON ... ECE 1 2 3 4 5 6 7 8
K6-III 400MHz				ON ... ECE 1 2 3 4 5 6 7 8
K6-III 450MHz				ON ... ECE 1 2 3 4 5 6 7 8

2.2 Clear CMOS Jumper: JBAT1

A battery must be used to retain the mainboard configuration in CMOS RAM. Short 1-2 pins of JBAT1 to store the CMOS data.

JBAT1
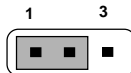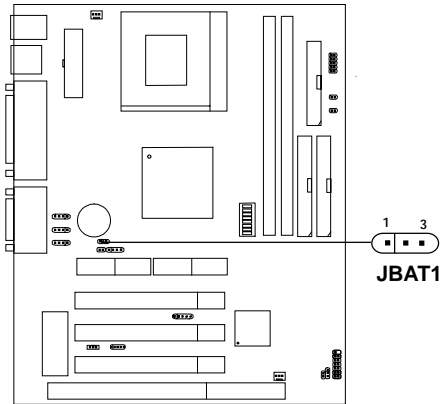
Keep Data
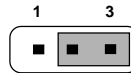
Clear Data

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 wall socket.

2.3 Memory Installation

2.3-1 Memory Bank Configuration

The mainboard supports a maximum memory size of 256MB(64-bit technology) or 512MB(128-bit technology for SDRAM: It provides two 168-pin **unbuffered** DIMMs (Double In-Line Memory Module) sockets. It supports 8 MB to 128 Mbytes DIMM memory module.
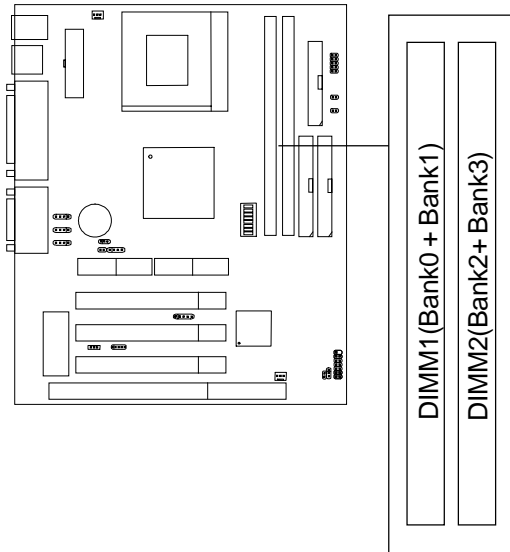
2.3-2   Memory Installation Procedures

A. How to install a DIMM Module
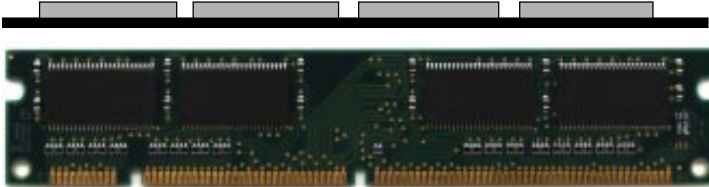
Single Sided DIMM
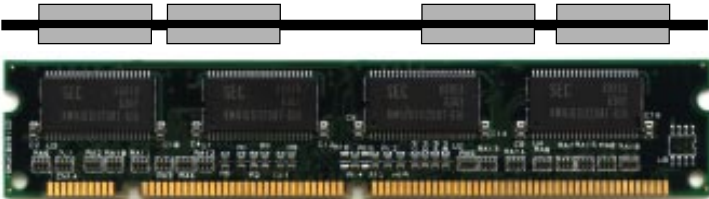
Double Sided DIMM

1. The DIMM slot has 2 Notch Keys "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
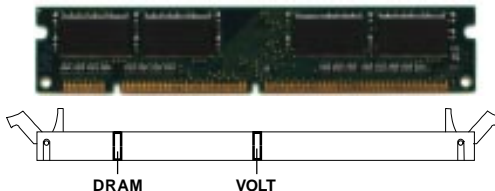
3. The plastic clip at the side of the DIMM slot will automatically close.

2.3-3 Memory Population Rules

1. Supports only SDRAM DIMM.

2. To operate properly, at least one 168-pin DIMM module must be installed.

3. This mainboard supports Table Free memory, so memory can be installed on DIMM1 or DIMM 2 in any order.

4. Supports 3.3 volt DIMM.

5. The DRAM addressing and the size supported by the mainboard is shown below:

Table 2.3-1 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
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
64M	2Mx32	ASYM	11	8	16MB	32MB
	4Mx16	ASYM	12	8	---	---
	8Mx8	ASYM	12	9	---	---

2.4 Case Connector: JFP1

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

JFP1
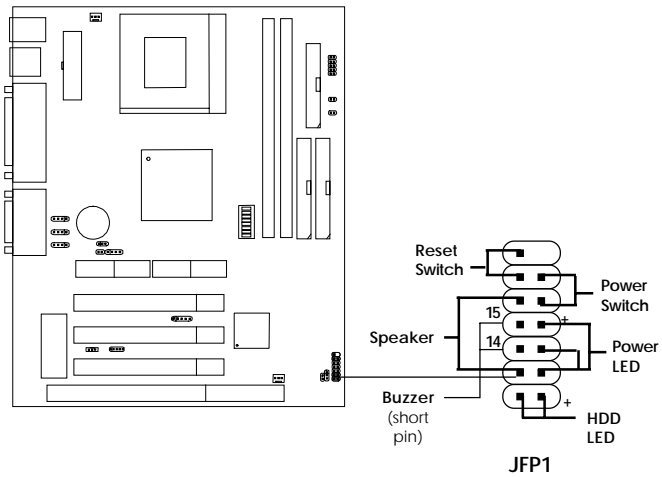
2.4-1 Power Switch

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

2.4-2 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.

2.4-3 Power LED

The Power LED is lit while the system power is on. Connect the Power LED from the system case to this pin. There are two types of LED that you can use: 3-pin single color LED or 2-pin dual color LED(ACPI request).

        a. 3 pin single color LED connect to pin 4, 5, & 6. This LED will lit when the system is on.

        b. 2 pin dual color LED connect to pin 5 & 6.

            GREEN Color: Indicate the system is in full on mode.

            ORANGE Color: Indicate the system is in suspend mode.

2.4-4 Speaker

Speaker from the system case is connected to this pin.

If on-board Buzzer is available:

Short pin 14-15:   On-board Buzzer Enabled.

Open pin 14-15:   On-board Buzzer Disabled.

2.4-5 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.

2.5 Floppy Disk Connector: FDD

The mainboard also provides a standard floppy disk connector FDD that supports 360K, 720K, 1.2M, 1.44M and 2.88M floppy disk types. This connector supports the provided floppy drive ribbon cables.
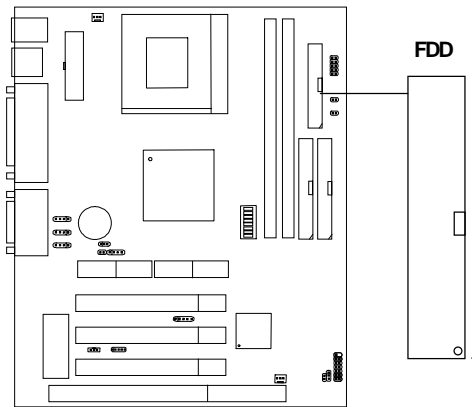
2.6 Hard Disk Connectors: IDE1 & IDE2

The mainboard has a 32-bit Enhanced PCI IDE and Ultra DMA33/66 Controller that provides PIO mode 0~4, Bus Master, and Ultra DMA 33/66 function. It has two HDD connectors IDE1 (primary) and IDE2 (secondary). You can connect up to four hard disk drives, CD-ROM, and other devices to IDE1 and IDE2. These connectors support the provided IDE hard disk cable.
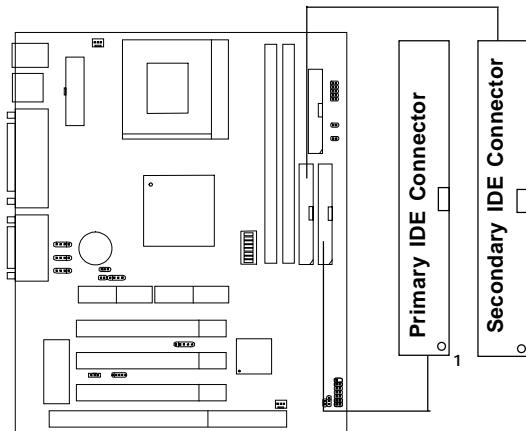
IDE1(Primary IDE Connector)

The first hard drive should always be connected to IDE1. IDE1 can connect a Master and a Slave drive. You must configure second hard drive to Slave mode by setting the jumper accordingly.

IDE2(Secondary IDE Connector)

IDE2 can also connect a Master and a Slave drive.

2.7 Power Supply

2.7-1 ATX 20-pin Power Connector: JPWR1

This connector supports the power button on-board. Using the ATX power supply, functions such as Modem Ring Wake-Up and Soft Power Off are supported by this mainboard. This power connector supports instant power on function which means that system will boot up instantly when the power connector is inserted on the board.

**ATX
Power Connector**
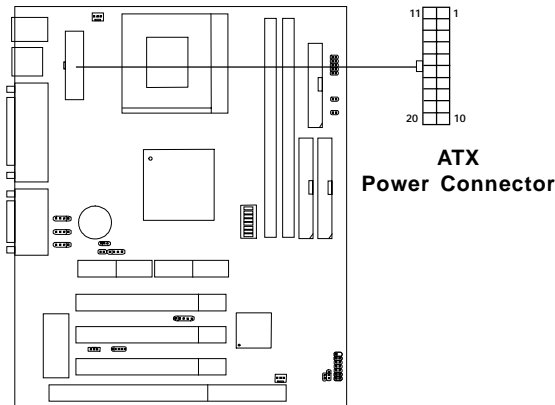
PIN DEFINITION

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.

2.7-2 Remote Power On/Off Switch: JRMS1

Connect to a 2-pin push button switch. During OFF state, press once and the system turns on. **During ON stage, push once and the system goes to sleep mode: pushing it more than 4 seconds will change its status from ON to OFF**. If you want to change the setup, you could go to the BIOS Power Management Setup. This is only used for ATX type power supply.

JRMS1
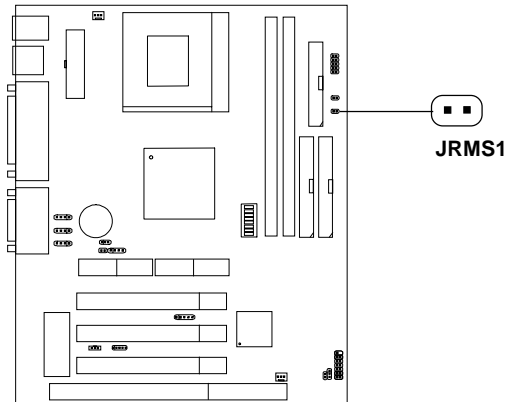
2.8 IrDA Infrared Module Connector: IR1

The mainboard provides one infrared (IR1) 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.
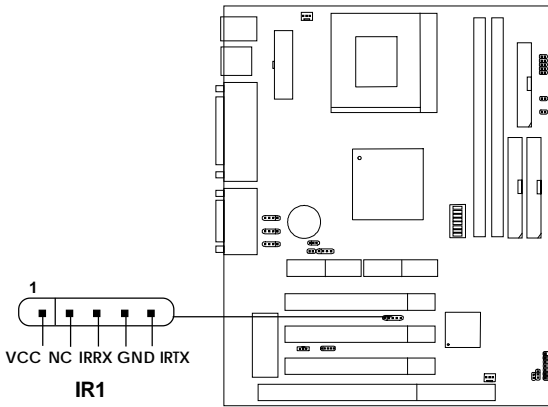
2.9 Serial Port Connectors: COM A

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.
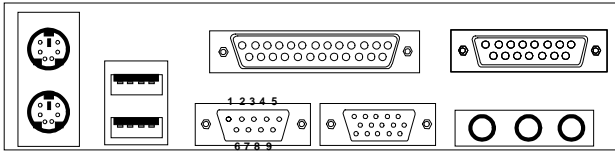
COM A

Serial Port (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)

2.10 VGA DB 15 Pin Connector

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

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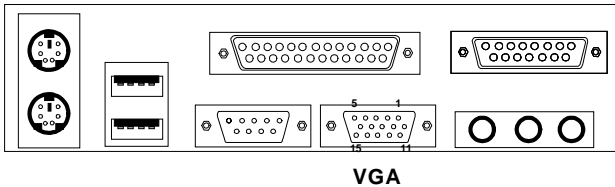
Analog Video Display Connector(DB15-S)	
Pin	Signal Description
1	Red
2	Green
3	Blue
4	Not used
5	Ground
6	Ground
7	Ground
8	Ground
9	Not used
10	Ground
11	Not used
12	SDA
13	Horizontal Sync
14	Vertical Sync
15	SCL

2.11 Parallel Port Connector: LPT1

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)

LPT 1
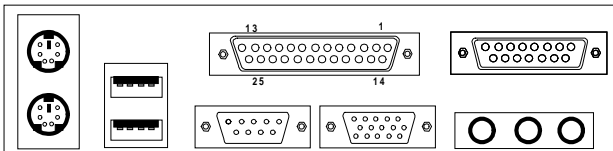
PIN DEFINITION

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		

2.12 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:
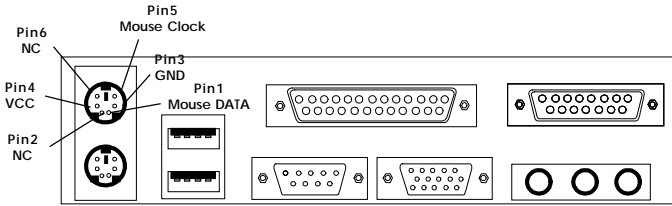
PS/2 Mouse (6-pin Female)

2.13 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.
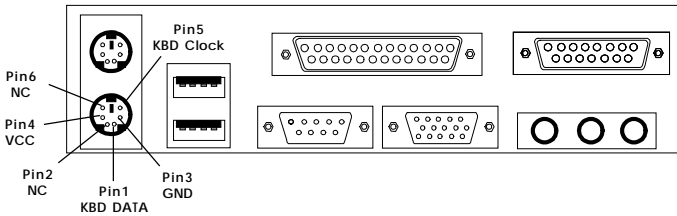
PS/2 Keyboard (6-pin Female)

2.14 Joystick/Midi Connectors

You can connect joystick or game pad to this connector.

Joystick/MIDI
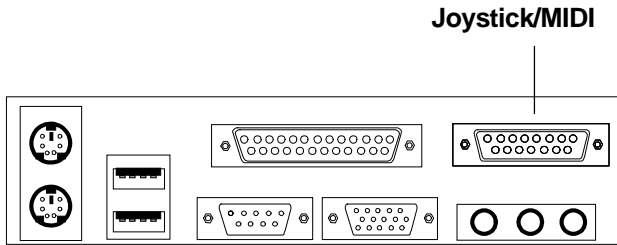
2.15 Audio Port Connectors

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
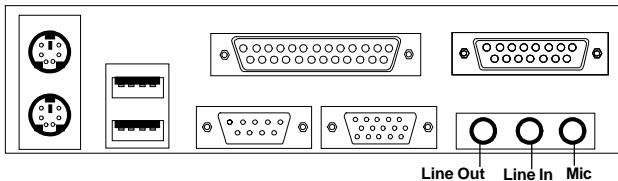
1/8" Stereo Audio Connectors

2.16 USB Connectors

The mainboard provides a **UHCI(Universal Host Controller Interface) 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
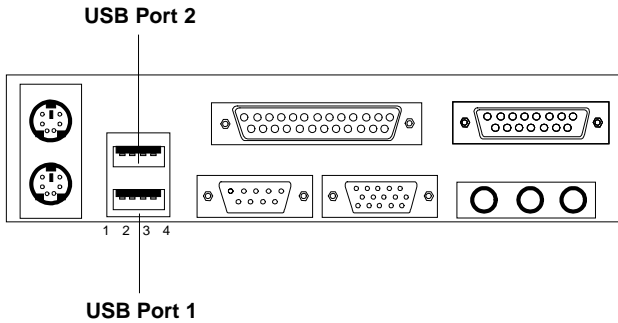
PIN	SIGNAL
1	VCC
2	-Data0
3	GND
4	+Data0

2.17 Power Saving Switch Connector: JGS1

Attach a power saving switch to **JGS1**. When the switch is pressed, the
system immediately goes into suspend mode. Press any key and the system
wakes up.

JGS1
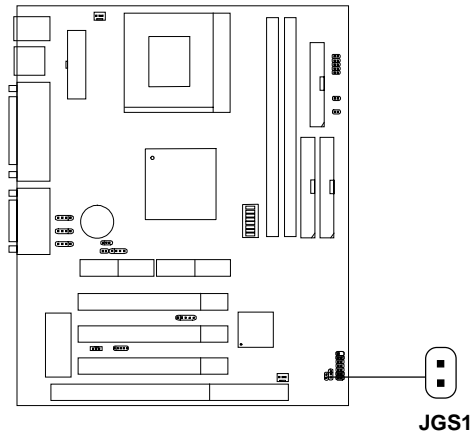
2.18 Power Saving LED Connector: JGL1

 JGL1 can be connected with an LED. There are two types of LED that you can use: 3-pin LED or 2-pin LED(ACPI request). When the 2-pin LED is connected to JGL1, the light will turn green, when system is On. During sleep mode, the 2-pin LED will change color from Green to Orange. For 3-pin LED, when LED is connected to JGL1, this will light when the system is On.

JGL1
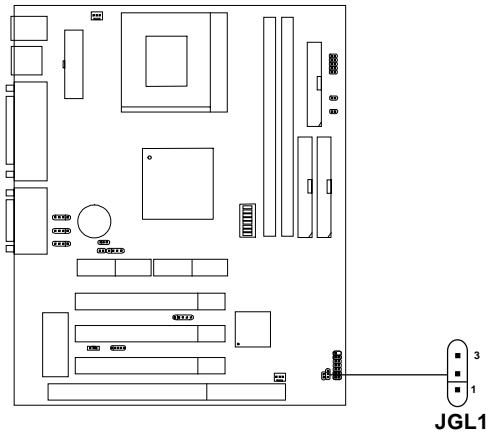
3-pin LED	2-pin LED
Green Color ... 3 ... Orange Color ... 1	Orange Color ... 3 ... Green Color ... 1
1-2 Single Color	1-2 Dual Color

2.19 Wake-Up on LAN Connector: JWOL1

The JWOL1 connector is for use with LAN add-on cards that supports Wake Up on LAN function. To use this function, you need to set the "Wake-Up on LAN" to enable at the BIOS Power Management Setup.
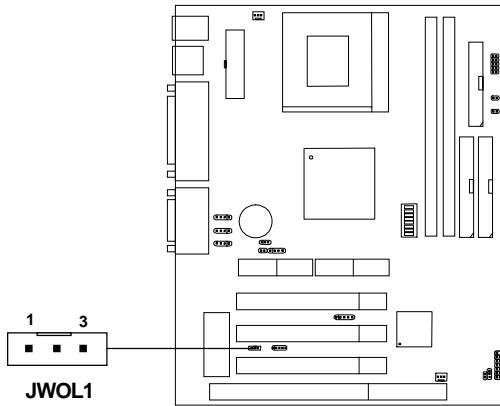
PIN	SIGNAL
1	5VSB
2	GND
3	MP_WAKEUP

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

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

2.20 Modem Wake Up Connector: JMDM1

The JMDM1 connector is for use with Modem add-on card that supports the Modem Wake Up function.

JMDM1
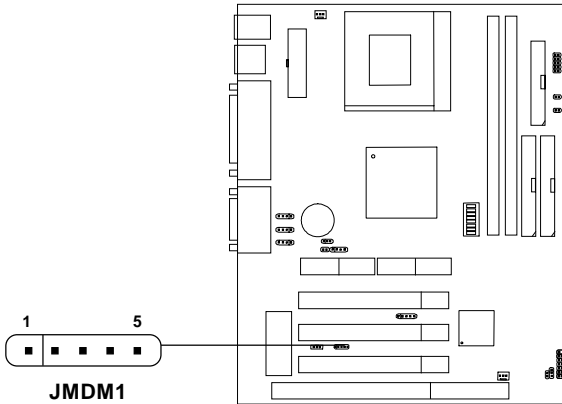
PIN	SIGNAL
1	NC
2	GND
3	MDM_WAKEUP
4	NC
5	5VSB

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

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

2.21 Modem-In: MODEM1

The connector is for Modem with internal voice connector.

SPK IN GND MIC OUT
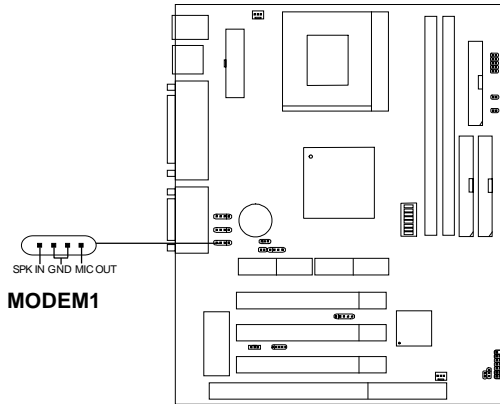
MODEM1

SPK_IN is connected to the Modem Speaker Out connector.
MIC_OUT is connected to the Modem Microphone In connector.

2.22 AUX Line In Connector: JAUX1

This connector is used for DVD Add on Card with Line In connector.

L GND R

JAUX1
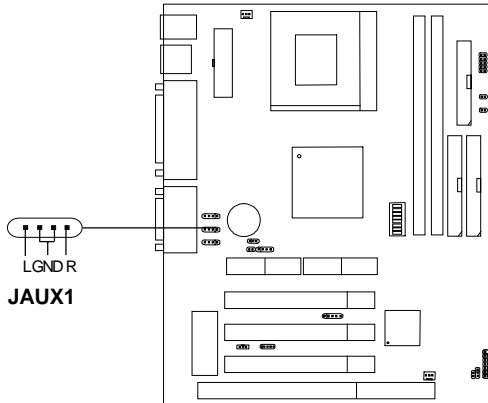
2.23 CD-In Connector: JCD1

This connector is for CD-ROM audio connector.
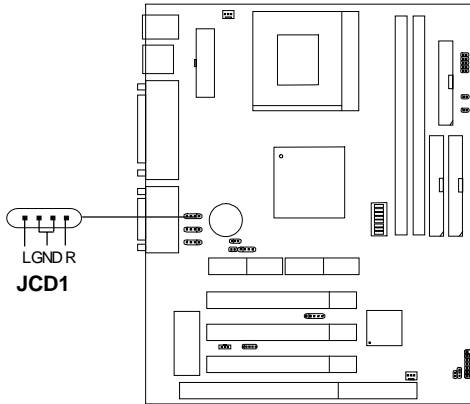
2.24 AMR (Audio Modem Riser)

The Audio/Modem Riser specification is an open industry-standard specification that defines a hardware scalable Original Equipmet Manufacturer (OEM) mainboard riser board and interface, which supports both audio and modem.

AMR
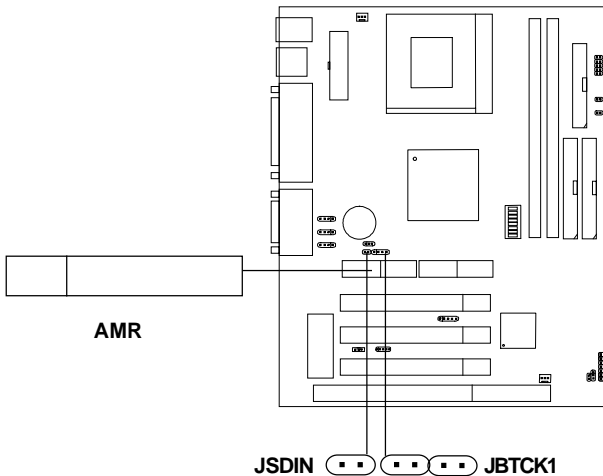
JSDIN ⦿ ⦿ ⦿ ⦿ ⦿ ⦿ ⦿ ⦿ JBTCK1

AMR/MR Card Jumper

JBTCK1	JSDIN1	Feature
4 [■■][■] 1	[■■]	**Onboard AC97 Audio and Modem Riser Card**
4 [■■][■ ■] 1	[■ ■]	**AMR Card**

2.25 PTI (PanelLink TV-Out Interface)

The TV-Out Interface is a MSI in-house design which support TV-out or PanelLink function. To be able to utilize both AMR and PTI simultaneously, you need to use MSI product like MS-5967 & MS-5966.

PTI
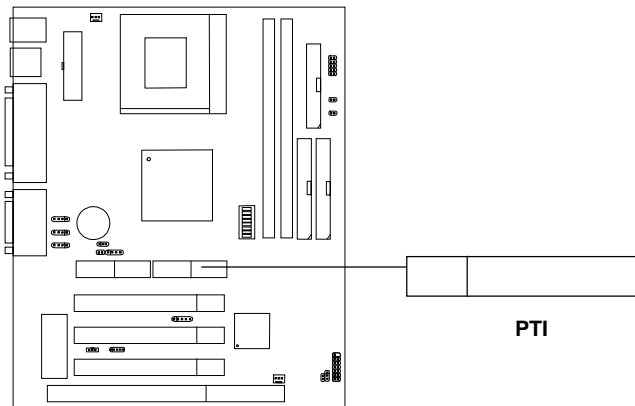
2.26 Power LED Connector: JPL1

JPL1 can be connected with an LED. When the system is powered on., the LED will lit. When the system is shutdown, the LED will ceased to lit.
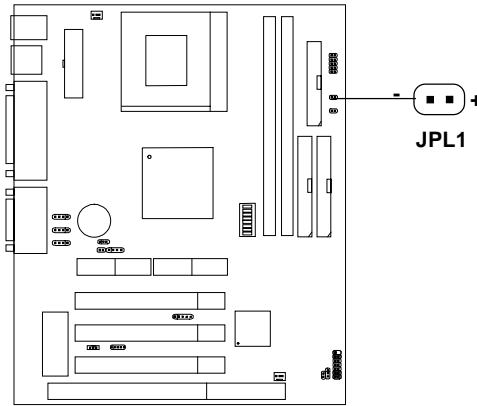
Chapter 3

AWARD® BIOS SETUP

Award® BIOS ROM has a built-in Setup program that allows users to modify the basic system configuration. This type of information is stored in battery-backed RAM (CMOS RAM), so that it retains the Setup information when the power is turned off.

3.1 Entering Setup

Power on the computer and press <Del> immediately to allow you to enter Setup. The other way to enter Setup is to power on the computer. When the below message appears briefly at the bottom of the screen during the POST (Power On Self Test), press <Del> key or simultaneously press <Ctrl>, <Alt>, and <Esc> keys.

PRESS <DEL> TO ENTER SETUP, <ESC> TO SKIP MEMORY TEST

If the message disappears before you respond and you still wish to enter Setup, restart the system to try again by turning it OFF then ON or pressing the "RESET" button on the system case. You may also restart by simultaneously pressing <Ctrl>, <Alt>, and <Delete> keys. If you do not press the keys at the correct time and the system does not boot, an error message will be displayed and you will again be asked to:

PRESS <F1> TO CONTINUE, <DEL> TO ENTER SETUP

3.2 Getting Help

Main Menu

The on-line description of the highlighted setup function is displayed at the bottom of the screen.

Status Page Setup Menu/Option Page Setup Menu

Press F1 to pop up a small help window that describes the appropriate keys to use and the possible selections for the highlighted item. To exit the Help Window, press <F1> or <Esc>.

3.3 The Main Menu

Once you enter Award® BIOS CMOS Setup Utility, the Main Menu (Figure 1) will appear on the screen. The Main Menu allows you to select from twelve setup functions and two exit choices. Use arrow keys to select among the items and press <Enter> to accept or enter the sub-menu.

```
               ROM  PCI/ISA  BIOS  (2A5LEM4F)
                    CMOS  SETUP  UTILITY
                    AWARD  SOFTWARE,  INC.
 ┌────────────────────────────────────────────────────────┐
 │                                                        │
 │  STANDARD  CMOS  SETUP      SPECIAL  FEATURES  SETUP    │
 │                                                        │
 │  BIOS  FEATURES  SETUP      INTEGRATED  PERIPHERALS     │
 │                                                        │
 │  CHIPSET  FEATURES  SETUP   SUPERVISOR  PASSWORD        │
 │                                                        │
 │  POWER  MANAGEMENT  SETUP   USER  PASSWORD              │
 │                                                        │
 │  PNP/PCI  CONFIGURATION     IDE  HDD  AUTO  DETECTION   │
 │                                                        │
 │  LOAD  BIOS  DEFAULTS       SAVE  &  EXIT  SETUP        │
 │                                                        │
 │  LOAD  SETUP  DEFAULTS      EXIT  WITHOUT  SAVING       │
 │                                                        │
 ├────────────────────────────────────────────────────────┤
 │  Esc : Quit              ↑↓→←    : Select Item         │
 │  F10 : Save & Exit Setup (Shift)F2 : Change Color      │
 │                                                        │
 │                                                        │
 │        Time,  Date,  Hard  Disk  Type...               │
 │                                                        │
 └────────────────────────────────────────────────────────┘
```

Standard CMOS Setup

This setup page includes all the items in a standard compatible BIOS.

BIOS Features Setup

This setup page includes all the items of Award special enhanced features.

Chipset Features Setup

This setup page includes all the items of chipset special features.

Power Management Setup

This category determines the power consumption for system after setting the specified items. Default value is Disable.

PCI Configuration Setup

This category specifies the IRQ level for PCI and ISA devices.

Load BIOS Defaults

BIOS Defaults will indicate the value required by the system for safe performance.

Load Setup Defaults

Chipset defaults indicates the values required by the system for the maximum performance.

Special Features Setup

This function is reserved for System Hardware Monitor.

Integrated Peripherals

Change, set, or disable onboard I/O, IRQ, and DMA assignement.

Supervisor Password/User Password

Change, set or disable password. This function allows the user access to the system and setup or just setup.

IDE HDD Auto Detection

Automatically configure hard disk parameters.

Save & Exit Setup

Save CMOS value changes to CMOS and exit setup.

Exit Without Saving

Abandon all CMOS value changes and exit setup.

3.4 Standard CMOS Setup

The items in Standard CMOS Setup Menu are divided into 10 catego-
ries. Each category includes no, one or more than one setup items. Use the
arrow keys to highlight the item and then use the <PgUp> or <PgDn> keys
to select the value you want in each item.

```
                ROM  PCI/ISA  BIOS  (2A5LEM4F)
                     STANDARD  CMOS  SETUP
                    AWARD  SOFTWARE,  INC.

 Date(mm:dd:yy):  Fri,  Feb  28,1997
 Time(hh:mm:ss):  00:00:00

  HARD  DISKS      TYPE  SIZE  CYLS  HEADS  PRECOMP  LANDZONE   SECTOR MODE
 Primary Master:   Auto   0     0     0        0        0         0    AUTO
 Primary Slave :   Auto   0     0     0        0        0         0    AUTO
 Secondary Master : Auto  0     0     0        0        0         0    AUTO
 Secondary Slave  : Auto  0     0     0        0        0         0    AUTO


 Drive  A :  1.44M,3.5in.   Base  Memory:              640K
 Drive  B :  None            Extended  Base  Memory:15360K
                              Other  Memory:            384K
 Video      : EGA/VGA
 Halt  On :  All, but Keyboard  Total  Memory:         16384K


    ESC :  Quit      ↑↓→←  : Select Item    PU/PD/+/- : Modify
    F1  : Help       (Shift)F2 : Change Color
```

Date

The date format is <day><month> <date> <year>.

Day	Day of the week, from Sun to Sat, determined by BIOS. Read-only.
month	The month from Jan. through Dec.
date	The date from 1 to 31 can be keyed by numeric function keys.
year	The year, depends on the year of the BIOS

Time

The time format is <hour> <minute> <second>.

PrimaryMaster/PrimarySlave
SecondaryMaster/Secondary Slave

These categories identify the types of 2 channels that have been installed in the computer. There are 45 pre-defined types and 4 user definable types for Enhanced IDE BIOS. Type 1 to Type 45 are pre-defined. Type User is user-definable.

Press PgUp/<+> or PgDn/<-> to select a numbered hard disk type or type the number and press <Enter>.   Note that the specifications of your drive must match with the drive table. The hard disk will not work properly if you enter improper information for this category. If your hard disk drive type is not matched or listed, you can use Type User to define your own drive type manually.

If you select Type User, related information is asked to be entered to the following items. Enter the information directly from the keyboard and press <Enter>. This information should be provided in the documentation from your hard disk vendor or the system manufacturer.

If the controller of HDD interface is ESDI, the selection shall be
                              "Type 1".
If the controller of HDD interface is SCSI, the selection shall be
                              "None".
If the controller of HDD interface is CD-ROM, the selection shall be
                              "None".

CYLS.	number of cylinders
HEADS	number of heads
PRECOMP	write precom
LANDZONE	landing zone
SECTORS	number of sectors
MODE HDD	access mode

3.5 BIOS Features Setup

```
ROM PCI/ISA BIOS (2A5LEM4F)
       BIOS FEATURES SETUP
      AWARD SOFTWARE, INC.
```

```
┌─────────────────────────────────────┬──────────────────────────────────┐
│ Anti-Virus Protection   : Disabled  │ Video BIOS Shadow       :Enabled  │
│ CPU Internal Cache      : Enabled   │ C8000-CBFFF Shadow      :Disabled │
│ External Cache          : Enabled   │ CC000-CFFFF Shadow      :Disabled │
│ Quick Power on Self Test : Enabled  │ D0000-D3FFF Shadow      :Disabled │
│ Boot From LAN First     : Enabled   │ D4000-D7FFF Shadow      :Disabled │
│ Boot Sequence           : A,C,SCSI  │ D8000-DBFFF Shadow      :Disabled │
│ Swap Floppy Drive       : Disabled  │ DC000-DFFFF Shadow      :Disabled │
│ Boot up Floppy Seek     : Enabled   │                                   │
│ Boot up NumLock status  : On        │                                   │
│ Gate A20 Option         : Fast      │                                   │
│ Security Option         : Setup     │                                   │
│ PCI/VGA palette snoop   : Disabled  │                                   │
│ OS select for DRAM>64MB : Non-OS2   │                                   │
│ Report No FDD For WIN 95 : No       │                                   │
│                                     │                                   │
│                                     ├──────────────────────────────────┤
│                                     │ Esc : Quit   ↑↓→←: Select item    │
│                                     │ F1 : Help PU/PD/+/- : modify      │
│                                     │ F5 : Old Value(Shift) F2 : Color  │
│                                     │ F7 : Load Setup Defaults          │
│                                     │                                   │
└─────────────────────────────────────┴──────────────────────────────────┘
```

Anti-Virus Protection

During and after the system boots up, any attempt to write to the boot sector or partition table of the hard disk drive will halt the system and the following error message will appear. For the meantime, you can run an anti-virus program to locate the problem. The settings are Enabled or Disabled.

> **!WARNING!**
> Disk Boot Sector is to be modified
> Type "Y" to accept write or "N" to abort write
> Award Software, Inc.

Disabled (default)	No warning message to appear when anything attempts to access the boot sector or hard disk partition table.
Enabled	Activates automatically when the system boots up causing a warning message to appear when anything attempts to access the boot sector of hard disk partition table.

Note: *This function is available only for DOS and other OS that do not trap INT13.*

CPU Internal Cache

The default value is Enabled. If your CPU is without Internal Cache then this item "CPU Internal Cache" will not be shown.

Enabled (default)	Enable cache
Disabled	Disable cache

Note: The internal cache is built in the processor.

CPU External Cache

Choose Enabled (default) or Disabled. This option enables the level 2 cache memory.

Quick Power On Self Test

This category speeds up Power On Self Test (POST) after you power on the computer. If this is set to Enabled, BIOS will shorten or skip some check items during POST.

Enabled (default)	Enable quick POST
Disabled	Normal POST

Boot From LAN First

During Enabled, if there's a LAN card Onboard, the booting priority will be from the LAN card. The default setting is Enabled.

Boot Sequence

This category determines which drive the computer searches first for the disk operating system (i.e., DOS). The settings are A,C,SCSI/C,A,SCSI/ C,CD-ROM,A/CD-ROM,C,A/D,A,SCSI/E,A,SCSI/F,A,SCSI/SCSI,A,C/ SCSI,C,A/C only, LS/ZIP,C. Default value is A, C, SCSI.

Swap Floppy Drive

Switches the floppy disk drives between being designated as A and B. Default is Disabled.

Boot Up Floppy Seek

During POST, BIOS will determine if the floppy disk drive installed is 40 or 80 tracks. 360K type is 40 tracks while 720K, 1.2M, and 1.44M are all 80 tracks.

Enabled(default)	BIOS searches for floppy disk drive to determine if it is 40 or 80 tracks. Take note that BIOS can not tell from 720K, 1.2M , or 1.44M drive type as they are all 80 tracks.
Disabled	BIOS will not search for the type of floppy disk drive by track number. There will be no warning message if the drive installed is 360K.

Boot Up NumLock Status

The default value is On.

On (default)	Keypad is numeric keys.
Off	Keypad is arrow keys.

Gate A20 Option

Normal	The A20 signal is controlled by keyboard controller or chipset hardware.
Fast (default)	The A20 signal is controlled by port 92 or chipset specific method.

Security Option

This category allows you to limit access to the system and Setup, or just to Setup.

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

Setup(default)   The system will boot, but access to Setup will be denied if the correct password is not entered at the prompt.

PCI VGA Palette Snooping

Choose Disabled or Enabled. Some graphic controllers which are not VGA compatible, take the output from a VGA controller and map it to their display as a way to provide the boot information and the VGA compatibility.

However, the color information coming from the VGA controller is drawn from the palette table inside the VGA controller to generate the proper colors, and the graphic controller needs to know what is in the palette of the VGA controller. To do this, the non-VGA graphic controller watches for the Write access to the VGA palette and registers the snoop data. In PCI based systems, where the VGA controller is on the PCI bus and a non-VGA graphic controller is on an ISA bus, the Write Access to the palette will not show up on the ISA bus if the PCI VGA controller responds to the Writes.

In this case, the PCI VGA controller should not respond to the Write. It should only snoop the data and permit the access to be forwarded to the ISA bus. The non-VGA ISA graphic controller can then snoop the data on the ISA bus. Unless you have the above situation, you should disable this option.

Disabled (default)   Disables the function
Enabled   Enables the function

OS Selection for DRAM > 64MB

Allows OS2® to be used with > 64 MB of DRAM. Settings are Non-OS/2 (default) and OS2. Set to OS/2 if using more than 64MB and running OS/2®.

Report No FDD For WIN 95

This function is only used when you are testing SCT for Windows® 95 Logo.

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

C8000 - CFFFF Shadow/E8000 - EFFFF Shadow

Determines whether the optional ROM will be copied to RAM for faster execution.

> **Enabled**   Optional shadow is enabled
> **Disabled** (default)   Optional shadow is disabled

Note: For C8000-DFFFF optional-ROM on PCI BIOS , BIOS will automatically enable the shadow RAM. User does not have to select the item.

3.6 Chipset Features Setup

The Chipset Features Setup option is used to change the values of the chipset registers. These registers control most of the system options in the computer.

Choose the "CHIPSET FEATURES SETUP" from the Main Menu and the following screen will appear.

ROM PCI/ISA BIOS(2A5LEM4F**)**

```
Bank 0/1 DRAM Timing    :SDRAM 10ns  TV-Ot Mode                :NTSC
Bank 2/3 DRAM Timing    :SDRAM 10ns  Auto Detect DIMM/PCI Clk  :Enabled
SDRAM Cycle Length      :3           Spread Spectrum           :Enabled
DRAM Read Pipeline      :Enabled
Sustained 3T Write      :Enabled
Cache R/CPU W Pipeline  :Enabled
Cache Timing            :Fast
Video BIOS Cacheable    :Enabled
System BIOS Cacheable   :Enabled
Memory Hole             :Disabled
Init Display First      :PCI Slot
Frame Buffer Size       :8M
AGP Aperture Size       :64M
Onchip USB              :Enabled
USB Keyboard Support    :Disabled
Onchip Sound            :Enabled    Esc : Quit   ↑↓→←: Select item
Onchip Modem            :Disabled   F1 : Help PU/PD/+/- : modify
                                    F5 : Old Value(Shift) F2 : Color
                                    F7 : Load Setup Defaults
```

Note: Change these settings only if you are familiar with the chipset.

Bank 0/1 DRAM Timing
Bank 2/3 DRAM Timing
        The DRAM timing is controlled by the DRAM Timing Registers. The
Timings programmed into this register are dependent on the system design.
Slower rates may be required in certain system designs to support loose
layouts or slower memory.

SDRAM Cycle Length
        This item allows you to select the SDRAM cycle length. The set-
tings are 2 or 3.

DRAM Read Pipeline
        This item sets the timing for pipeline burst mode read from DRAM.
The default setting is Enabled.

Sustained 3T Write
        This item select the access method of Cache.
        Enabled   Write Through
        Disabled   Write Back

Cache R/CPU w Pipeline
        This item can enabled the pipelining of Cache read and CPU write
cycle. The default setting is Enabled.

Cache Timing
        This field allows you to determine the Cache burst mode timing.
        Fast   Cache burst mode timing are 31112111.
        Fastest   Cache burst mode timing are 31111111.

Video BIOS Cacheable
        Select Enabled allows caching of the system BIOS ROM at C0000h-
F7FFFh, resulting in better video performance. However, if any program
writes to this memory area, a system error may result.
        Enabled (Default)   Video BIOS access cached
        Disabled   Video BIOS access not cached

System BIOS Cacheable

Select Enabled allows caching of the system BIOS ROM at F000h-FFFFFh, resulting in better system performance. However, if any program writes to this memory area, a system error may result.

Enabled (default)	BIOS access cached
Disabled	BIOS access not cached

Memory Hole

In order to improve performance, certain space in memory can be reserved for ISA cards. This memory must be mapped into the memory space below 16 MB.

Enabled	Memory hole supported.
Disabled (default)	Memory hole not supported.

Init Display First

Select whether to use PCI Slot VGA card or onboard VGA as the initial Display on the monitor.

Frame Buffer Size

Select the Frame Buffer size. The settings are NA, 4M, 8M.

AGP Aperture Size (MB)

Select the size of the Accelerated Graphics Port (AGP) aperture. The aperture is a portion of the PCI memory address range dedicated for graphics memory address space. Host cycles that hit the aperture range are forwarded to the AGP without any translation.

Onchip USB

Set this option to Enable or Disable the onchip USB controller. The default setting is Enabled.

USB Keyboard Support

Set this option to Enable or Disable the USB keyboard/mouse support. The default setting is Disabled.

Onchip Sound

This item allows you to enabled or disabled the onboard sound chip. To enabled the onboard audio, set this item to enabled. Then, short JRTCK1 pin 1-2 and JSDIN pin 1-2.

Onchip Modem

This item allows you to enabled or disabled the Soft Wave Modem for AMR(Modem Riser Card).

TV-Out Mode

This item only work with MS-5967 TV-Out Interface installed. The settings are NTSC, PAL, Brazil.

Auto Detect DIMM/PCI Clk

This item allows the clock generator to auto-detect the interface of DIMM/PCI. If there's no DIMM/PCI card present, then the clock will be shut down. The default setting is Enabled.

Spread Spectrum

This item allows you to select the clock generator Spread Spectrum function. When overclocking the processor, always set this item to Disabled. The default is enabled.

3.7 Power Management Setup

The Power Management Setup will appear on your screen like this:

```
              ROM  PCI/ISA  BIOS  (2A5LEM4F)
                 POWER  MANAGEMENT  SETUP
                  AWARD  SOFTWARE,  INC.
```

```
Power Management    :User Define    IRQ3(COM2)            :Primary
PM Control by APM   :Yes            IRQ4(COM1)            :Primary
Video Off Method    :DPMS Support   IRQ5(LPT2)            :Primary
Video Off After     :Suspend        IRQ6(FDD)             :Primary
Modem Use IRQ       :NA             IRQ7(LPT1)            :Primary
Reserved IRQ 9      :Enabled        IRQ8(RTC Alarm)       :Disabled
Doze Mode           :4 min          IRQ9(rsv)             :Secondary
Suspend Mode        :8 min          IRQ10(rsv)            :Secondary
HDD Power Down      :12 min         IRQ 11(Rsv)           :Primary
Soft-Off by PWR-BTTN:Delay 4sec     IRQ12(PS/2 mouse)     :Primary
CPU Fan In Suspend  :Off            IRQ13(Copro)          :Primary
LED in Suspend      :Dual           IRQ14(Hard Disk)      :Primary
                                    IRQ15(Rsv)            :Disabled
***PM Events***
VGA                 :OFF
LPT&COM             :LPT/COM
HDD&FDD             :ON
DMA/master          :OFF            Esc : Quit    ↑↓→←: Select item
RTC Alarm Resume    :Disabled       F1 : Help PU/PD/+/- : modify
Wake Up by LAN/Ring :Disabled       F5 : Old Value(Shift) F2 : Color
                                    F7 : Load Setup Defaults
```

Power Management

This category determines the power consumption for system after selecting below items. Default value is Disable. The following pages tell you the options of each item & describe the meanings of each options.

Power Management

User Define	Users can configure their own power management.
Min Saving	Pre-defined timer values are used such that all timers are in their MAX value.
Max Saving	Pre-defined timer values are used such that all timers are in their MIN value.

PM Control by APM

No	System BIOS will ignore APM when power managing the system.
Yes	System BIOS will wait for APM's prompt before it enter any PM mode

Note : Enable this for O.S. with APM like Windows® 95/98, Windows® NT, etc.

Video Off Method

Blank Screen	The system BIOS will only blank off the screen when disabling video.
V/H SYN C+Blank	In addition to (1), BIOS will also turn off the V-SYNC & H-SYNC signals from VGA card to monitor.
DPMS (default)	This function is enabled only for VGA card supporting DPMS.

Note: Green monitors detect the V/H SYNC signals to turn off its electron gun.

Video Off After

The settings are N/A, Standby, Doze, or Suspend. This option is for choosing the setting in which the monitor will turn off.

N/A	Always turn on.
Doze	During Doze mode, the monitor will be turned off.
Standby	During Standby mode, the monitor will be turned off.
Suspend	During Suspend mode, the monitor will be turned off.

The default setting is Standby.

MODEM Use IRQ

Name the interrrupt request (IRQ) line assigned to the modem (if any) on your system. Activity of the selected IRQ always awakens the system. The settings are NA, 3, 4, 5, 7, 9, 10, or 11.

Reserve IRQ 9

This item is reserved for Windows® 98 ACPI mode. Choose yes, if you use Windows® 98 ACPI mode. Otherwise, set to no.

Doze Mode

Disable	System will never enter DOZE mode.
10sec/20sec/30sec/ 40sec/1min/2min/ 4min/6min/8min/ 10min/20min/ 30min/40min/ 1hr	Defines the continuous idle time before the system enters DOZE mode. If any item defined in the options of "Power Down and Resume events" is enabled & active, DOZE timer will be reloaded. When the system have entered Doze mode, any of the items enabled in "Wake Up Events in Doze and Standby" will trigger the system to wake up.

Suspend Mode

Disable	System will never enter STANDBY mode.
10sec/20sec/30sec/ 40sec/1min/2min/ 4min/6min/8min/ 10min/20min/ 30min/40min/ 1hr	Defines the continuous idle time before the system enters STANDBY mode. If any item defined in the options of "Power Down and Resume events" is enabled & active, STANDBY timer will be reloaded. When the system has entered Standby mode, any of the items that are enabled in "Wake Up Events of Doze and Standby" will trigger the system to wake up.

HDD Power Down

Disable	HDD's motor will not shut off.

1 Min/2 Min/	Defines the continuous HDD idle time before
3 Min/4 Min/	the HDD enters the power saving mode (motor
5 Min/6 Min/	off). BIOS will turn off the HDD's motor when
7 Min/8 Min/	time is out.
9 Min/10 Min/	
11 Min/12 Min/	
13 Min/14 Min/	
15 Min	

Soft-off by PWRBTN

This field is for the soft-off function setting. When the board utilizes an ATX power supply, two types of settings are offered: Delay 4 sec. and Instant-off. When the setting is Delay 4 sec., users can power off the system by pressing POWER-ON button for 4 seconds. However, if users press POWER-ON button for less than 4 seconds, the system will enter suspend mode only. When the setting is Instant-off, pressing the POWER-ON button once will power off the system, and pressing again will power on the system.

CPU Fan in Suspend

During Off, if the system goes into suspend mode, the CPU fan will also stop. During On, the CPU fan will not stop.

LED in Suspend

This item determines which state the power LED will use. The settings are Dual color, and Single Color. During Dual Color, the Power LED will change its color in suspend mode. During Single Color, the Power LED will always remain lit.

PM Events

Award BIOS defines 7 PM events in the power management mode (Doze &suspend). The user can initialize any PM Events to be Enable or Disable. When the system detects all of the enabled events do not have any activity, it will start the system Doze timer first if the Power Management is not Disabled. Once the system Doze timer is timed out, it will process doze power saving procedure by starting the system suspend timer. When the suspend timer times out, all of the CPU clock will stop by dropping system clock down to zero and remains this way until any one of the enabled events occurrs.

VGA	**ON/OFF**
LPT &COM	**NONE/LPT/COM/LPT&COM**
HDD & FDD	**ON/OFF**
DMA/Master	**ON/OFF**

RTC Alarm Resume

This function is for setting date and time for your computer to boot up. During Disabled, you cannot use this function. During Enabled, choose the Date and Time Alarm:

Date(of month) Alarm	You can choose which day of the month the system will boot up. Set to 0, to boot every day.
Time(hh:mm:ss) Alarm	You can choose what hour, minute and 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, before this function will work.

Wake Up by LAN/Ring

During disabled, the system will ignore any incoming call from the Modem or LAN. During Enabled, the system will boot up if there's an incoming call from the Modem or LAN.

3.8 PNP/PCI Configuration Setup

You can manually configure the PCI Device's IRQ. The following pages tell you the options of each item & describe the meanings of each options.

```
            ROM  PCI/ISA  BIOS  (2A5LEM4F)
            PNP/PCI  CONFIGURATION  SETUP
                AWARD  SOFTWARE,  INC.
```

```
┌─────────────────────────────────────────┬──────────────────────────────────────┐
│ PnP OS Installed        :Yes             │ CPU to PCI Write Buffer  :Enabled     │
│ Resources Controlled By  :Manual         │ PCI Dynamic Bursting     :Enabled     │
│ Reset Configuration Data :Disabled       │ PCI Master 0 WS Write    :Enabled     │
│                                          │ PCI Delay Transaction    :Enabled     │
│ IRQ-3 assigned to       :Legacy ISA      │ PCI#2 Access#1 Retry     :Enabled     │
│ IRQ-4 assigned to       :Legacy ISA      │ AGP Master 1 WS Write    :Enabled     │
│ IRQ-5 assigned to       :PCI/ISA PnP     │ AGP Master 1 WS Read     :Disabled    │
│ IRQ-7 assigned to       :PCI/ISA PnP     │                                       │
│ IRQ-9 assigned to       :PCI/ISA PnP     │ Assign IRQ for VGA       :Enabled     │
│ IRQ-10assigned to       :PCI/ISA PnP     │                                       │
│ IRQ-11assigned to       :PCI/ISA PnP     │                                       │
│ IRQ-12assigned to       :PCI/ISA PnP     │                                       │
│ IRQ-14assigned to       :PCI/ISA PnP     │                                       │
│ IRQ-15assigned to       :PCI/ISA PnP     │                                       │
│ DMA-0assigned to        :PCI/ISA PnP     │                                       │
│ DMA-1assigned to        :PCI/ISA PnP     ├──────────────────────────────────────┤
│ DMA-3assigned to        :PCI/ISA PnP     │ Esc : Quit    ↑↓→←: Select item      │
│ DMA-5assigned to        :PCI/ISA PnP     │ F1 : Help PU/PD/+/- : modify          │
│ DMA-6assigned to        :PCI/ISA PnP     │ F5 : Old Value(Shift) F2 : Color      │
│ DMA-7assigned to        :PCI/ISA PnP     │ F7 : Load Setup Defaults              │
└─────────────────────────────────────────┴──────────────────────────────────────┘
```

PnP OS Installed
When set to YES, BIOS will only initialize the PnP cards used for booting (VGA, IDE, SCSI). The rest of the cards will be initialized by the PnP operating system like Windows® 95 or 98. When set to NO, BIOS will initialize all the PnP cards. So, for non-PnP operating system (DOS, Netware®), this option must set to Yes.

Resources Controlled By

By Choosing "Auto" (default), the system BIOS will detect the system resource and automatically assign the relative IRQ and DMA Channel for each peripheral.

By Choosing "Manual", the user will need to assign IRQ & DMA for add-on cards. Be sure that there is no conflict for IRQ/DMA and I/O ports.

Note: When choosing "Auto" you must be sure that all of the system add-on cards are PnP type.

Reset Configuration Data

The system BIOS supports the PnP feature so the system needs to record which resource is assigned and protect resources from conflict. Every peripheral device has a node which is called ESCD. This node records which resources are assigned to it. The system needs to record and update ESCD to the memory locations. These locations (4K) are reserved at the system BIOS.

If Disabled (default) is chosen, the system's ESCD will update only when the new configuration varies from the last one.

If Enabled is chosen, the system will be forced to update the system's ESCD. Then, this option will be auto-set to Disable.

IRQ-3   assigned to : Legacy ISA
IRQ-4   assigned to : Legacy ISA
IRQ-5   assigned to : PCI/ISA PnP
IRQ-7   assigned to : PCI/ISA PnP
IRQ-9   assigned to : PCI/ISA PnP
IRQ-10 assigned to : PCI/ISA PnP
IRQ-11 assigned to : PCI/ISA PnP
IRQ-12 assigned to : PCI/ISA PnP
IRQ-14 assigned to : PCI/ISA PnP

IRQ-15 assigned to : PCI/ISA PnP
DMA-0 assigned to : PCI/ISA PnP
DMA-1 assigned to : PCI/ISA PnP
DMA-3 assigned to : PCI/ISA PnP
DMA-5 assigned to : PCI/ISA PnP
DMA-6 assigned to : PCI/ISA PnP
DMA-7 assigned to : PCI/ISA PnP

The above settings will be shown on the screen only if "Manual" is chosen for the *Resources Controlled By* function.

Legacy is the term which signifies that a resource is assigned to the ISA Bus and provides for non PnP ISA add-on card. PCI/ISA PnP signifies that a resource is assigned to the PCI Bus or provides for ISA PnP add-on cards and peripherals.

CPU to PCI Write Buffer
This item allows you to Enabled or Disabled the CPU to PCI Write Buffer. The default setting is Enabled.

PCI Dynamic Bursting
This setting allows you to Enabled or Disabled PCI Dynamic Bursting function. The default setting is Enabled.

PCI Master 0 WS Write
Enabled   zero wait state response.
Disabled   one wait state response.
The default setting is Enabled.

PCI Delay Transaction
This item allows you to Enabled or Disabled the PCI Delay Transaction.

PCI#2 Access #1 Retry

    Enabled   PCI#2 will be disconnected, if max retries are attempted without success.

    Disabled   PCI#2 will not be disconnected until access is finish.

Assign IRQ for VGA

    Lets the user choose which IRQ to assign for VGA card.

3.9 Load BIOS/Setup Defaults

This Main Menu item loads the default system values. If the CMOS is corrupted the defaults are loaded automatically. Choose this item and the following message appears:

" Load Setup Defaults (Y / N) ? N "

To use the Setup defaults, change the prompt to "Y" and press < Enter >

Note: The Setup defaults can be customized to increase performance. However the BIOS defaults can always be used as a back up if there is some problem with the mainboard operation.

3.10 Special Features Setup (optional)

This Special Features Setup is used by System Hardware Monitor chipset. You can manually change the value of each option.

```
                    ROM  PCI/ISA  BIOS  (2A5LEM4F)
                       INTEGRATED  PERIPHERALS
                        AWARD  SOFTWARE,  INC.
┌─────────────────────────────────┬─────────────────────────────────┐
│ ******** POST SHOWING ********   │ ********* SYSTEM MONITOR ******* │
│ CPU Fan Detected       :Enabled  │                                  │
│                                  │                                  │
│ Sys Fan Detected       :Disabled │ CPU Fan RPM            :6367      │
│ Chassis Fan Detected   :Disabled │ System Temperature    :26⁰C/78⁰F │
│ Voltage Detected       :Enabled  │ CPU Temperature       :28⁰C/82⁰F │
│ Vcore Voltage Detected :Enabled  │ CPU Critical Temp     :Disabled  │
│ +2.5V Voltage Detected :Enabled  │ Shutdown Temp         :Disabled  │
│ +3.3V Voltage Detected :Enabled  │                                  │
│ +5.0V Voltage Detected :Enabled  │                                  │
│ + 12V Voltage Detected :Enabled  │                                  │
│                                  │                                  │
│                                  │                                  │
│                                  │                                  │
│                                  ├──────────────────────────────────┤
│                                  │ Esc : Quit   ↑↓→←: Select item   │
│                                  │ F1 : Help PU/PD/+/- : modify     │
│                                  │ F5 : Old Value(Shift) F2 : Color │
│                                  │ F6 : Load BIOS Defaults          │
│                                  │ F7 : Load Setup Defaults         │
└─────────────────────────────────┴──────────────────────────────────┘
```

CPU Fan Detected/SYS Fan Detected/Chassis Intrusion Detected/Voltage Detected/Vcore Voltage Detected/+2.5V Voltage Detected/+3.3V Voltage Detected/+5.0 Voltage Detected/+12V Voltage Detected

During Enabled, this will show the CPU/FAN voltage chart during system boot up. During Disabled, this will not show.

CPU Fan RPM

During Enabled, this will monitor the RPM of your CPU fan.

System Temperature/CPU Temperature

This will show the System and CPU temperature.

CPU Critical Temp

This option is for setting the critical temperature level for the processor. When the processor reach the temperature you set, this will reduce the load on the processor.

Shutdown Temp

This option is for setting the Shutdown temperature level for the processor. When the processor reach the temperature you set, this will shutdown the system. This function only works with Windows® 95 operating system.

3.11 Integrated Peripherals

```
           ROM  PCI/ISA  BIOS  (2A5LEM4F)
               INTEGRATED  PERIPHERALS
               AWARD  SOFTWARE,  INC.
```

```
┌─────────────────────────────────────────┬─────────────────────────────────────────┐
│ Onchip IDE First Channel :Enabled        │ Onboard Parallel Mode    :ECP/EPP         │
│ Onchip IDE Second Channel:Enabled        │ ECP Mode Use DMA         :3               │
│ IDE Prefetch Mode        :Enabled        │ EPP Mode Select          :EPP1.9          │
│ IDE HDD Block Mode       :Enabled        │                                          │
│ Primary Master PIO       :Auto           │ Onboard Legacy Audio     :Enabled         │
│ Primary Slave PIO        :Auto           │ Sound Blaster            :Disabled        │
│ Secondary Master PIO     :Auto           │ SB I/O Base Address      :220H            │
│ Secondary Slave PIO      :Auto           │ SB IRQ Select            :IRQ5            │
│ Primary Master UDMA      :Auto           │ SB DMA Select            :DMA1            │
│ Primary Slave UDMA       :Auto           │ MPU-401                  :Disabled        │
│ Secondary Master UDMA:    Auto           │ MPU-401 I/O Address      :330-333H        │
│ Secondary Slave UDMA     :Auto           │ FM Port (388-38BH)       :Disabled        │
│                                          │ Game Port (200-207H)     :Enabled         │
│ Onboard FDD controller   :Enabled        │                                          │
│ Onboard Serial Port 1    :3F8/IRQ4       ├─────────────────────────────────────────┤
│ Onboard Serial Port 2    :Auto           │ Esc : Quit    ↑↓→←: Select item          │
│ UART2 Mode               :Standard       │ F1 : Help PU/PD/+/- : modify             │
│                                          │ F5 : Old Value(Shift) F2 : Color         │
│                                          │ F7 : Load Setup Defaults                  │
│ Onboard Parallel Port    :3F8/IRQ7       │                                          │
└─────────────────────────────────────────┴─────────────────────────────────────────┘
```

Onchip IDE First Channel
    Enabled/Disabled

Onchip IDE Second Channel
    Enabled/Disabled   The system provides for a On-Board On-
                           Chipset PCI IDE controller that supports Dual
                           Channel IDE (Primary and Secondary). A
                           maximum of 4 IDE devices can be supported. If
                           the user install the Off-Board PCI IDE controller
                           (i.e. add-on cards), the user must choose which
                           channels will be disabled. This will depend on
                           which channel will be used for the Off-Board
                           PCI IDE add-on card.

IDE Prefetch Mode
   Enabled/Disabled

IDE HDD Block Mode
   Enabled/Disabled   Enabled allows the Block mode access for the
                           IDE HDD.

Primary Master PIO
   Auto/Mode0/Mode1-4

Primary Slave PIO
   Auto/Mode0/Mode1-4

Secondary Master PIO
   Auto/Mode0/Mode1-4

Secondary Slave PIO
   Auto/Mode0/Mode1-4

For these 4 IDE options, choose "Auto" to have the system BIOS auto detect the IDE HDD operation mode for PIO access.

Note: Some IDE HDD can not operate at the responding HDD's mode. When the user has selected "Auto" and the system BIOS has accepted the HDD response mode, the user may degrade the HDD's operation mode. Ex: IF the HDD reported it can operate in mode 4 but it is not operating properly, the user will have to manually change the operation mode to mode 3.

Choosing Mode 1-4 will have the system ignore the HDD's reported operation mode and use the selected mode instead.

Note: According to ATA specs. Mode 4 transfer rate is > Mode 3 > Mode 2 > Mode 1 > Mode 0. If the user's HDD can operate at Mode 3 the user can also select a slower Mode (i.e. Mode 0-2) but not a faster Mode (ie Mode 4).

IOnboard FDD Controller

Enabled/Disabled   The system has an on-board Super I/O chip with a FDD controller that supports 2 FDDs for 360K/720K/1.2M/1.44M/ 2.8M. Choose "Enabled" to use the on-board FDD controller for accessing the FDD. Otherwise choose "Disabled" to use the off-board FDD controller.

Onboard Serial Port 1

Disabled/(3F8/IRQ4)/(2F8/IRQ3)/ (3E8/IRQ4)/(2E8/IRQ3)

Onboard Serial Port 2

Disabled/(3F8/IRQ4)/(2F8/IRQ3)/(3E8/IRQ4)/(2E8/IRQ3)

The system has an On-board Super I/O chipset with 2 serial ports. The On-board serial ports can be selected as:

> **Disabled**
> 3F8/IRQ4   COM 1 uses IRQ4
> 2F8/IRQ3   COM 2 uses IRQ3
> 3E8/IRQ4   COM 3 uses IRQ4
> 2E8/IRQ3   COM 4 uses IRQ3

Note: Because the ISA Bus Interrupt accepts low to high edge trigger, the interrupt request line cannot be shared by multiple sources. If an off-board ISA add-on card with a serial port is installed, the user may have to disable the on-board serial port because it will conflict with IRQ request line for the off-board serial port.

UART2 Mode

This item allows you to determine which Infra Red (IR) function of onboard I/O chip. If you choose IR function, the COM 2 will not function.

Onboard Parallel Port

Disabled
(3BCH/IRQ7)/
(278H/IRQ5)/
(378H/IRQ7)

There is a built-in parallel port on the on-board Super I/O chipset that provides Standard, ECP, and EPP features. It has the following options:

Disable
3BCH/IRQ7   Line Printer port 0
278H/IRQ5   Line Printer port 2
378H/IRQ7   Line Printer port 1

Onboard Parallel Mode

SPP : Standard Parallel Port
EPP : Enhanced Parallel Port
ECP : Extended Capability Port

To operate the onboard parallel port as Standard Parallel Port only, choose "SPP." To operate the onboard parallel port in the ECP and SPP modes simultaneously, choose "ECP/SPP." By choosing "ECP", the onboard parallel port will operate in ECP mode only. Choosing "ECP/EPP" will allow the onboard parallel port to support both the ECP and EPP modes simultaneously. The ECP mode has to use the DMA channel, so choose the onboard parallel port with the ECP feature. After selecting it, the following message will appear:

"ECP Mode Use DMA" At this time the user can choose between DMA channels 3 or 1. The onboard parallel port is EPP Spec. compliant, so after the user chooses the onboard parallel port with the EPP function, the following message will be displayed on the screen: "EPP Mode Select." At this time either EPP 1.7 spec. or EPP 1.9 spec. can be chosen.

Onboard Legacy Audio

This item is used to enabled/disabled the onboard legacy audio. If you want to use Game port or Midi Port, set this item to enabled.

3.12 Supervisor/User Password Setting

This Main Menu item lets you configure the system so that a password is required each time the system boots or an attempt is made to enter the Setup program. Supervisor Password allows you to change all CMOS settings but the User Password setting doesn't have this function. The way to set up the passwords for both Supervisor and User are as follow:

1. Choose "Change Password" in the Main Menu and press <Enter>. The following message appears:

<div align="center">"Enter Password:"</div>

2. The first time you run this option, enter your password up to only 8 characters and press <Enter>. The screen does not display the entered characters. For no password just press <Enter>.

3. After you enter the password, the following message appears prompting you to confirm the password:

<div align="center">"Confirm Password:"</div>

4. Enter exactly the same password you just typed in to confirm the password and press <Enter>.

5. Move the cursor to Save & Exit Setup to save the password.

6. If you need to delete the password you entered before, choose the Supervisor Password and press <Enter>. It will delete the password that you had before.

7. Move the cursor to Save & Exit Setup to save the option you did. Otherwise, the old password will still be there when you turn on your machine next time.

3.13 IDE HDD Auto Detection

You can use this utility to automatically detect the characteristics of most hard drives.

When you enter this utility, the screen asks you to select a specific hard disk for Primary Master. If you accept a hard disk detected by the BIOS, you can enter "Y" to confirm and then press <Enter> to check next hard disk. This function allows you to check four hard disks and you may press the <Esc> after the <Enter> to skip this function and go back to the Main Menu.

```
                        ROM  ISA  BIOS
                     CMOS  SETUP  UTILITY
                     AWARD  SOFTWARE,  INC.

  HARD DISKS          TYPE  SIZE  CYLS HEADS  PRECOMP  LANDZONE   SECTOR MODE
Primary  Master:      Auto   0     0    0       0         0         0    AUTO
Primary  Slave :      Auto   0     0    0       0         0         0    AUTO
Secondary  Master : Auto     0     0    0       0         0         0    AUTO
Secondary  Slave  : Auto     0     0    0       0         0         0    AUTO


            Select Primary Master    Option (N=Skip) : N

     OPTIONS    SIZE      CYLS    HEAD    PRECOMP  LANDZ  SECTOR MODE

        2       2112      1023     64        0      4094    63    LBA
        1       2113      4095     16      65535    4094    63    NORMAL
        3       2113      2047     32      65535    4094    63    LARGE



                         [ESC: Skip]
```

Chapter 4

VIA CHIPSET DRIVER

1. Overview

The MVP4 integrates an AGP 2.0 - compliant 2D/3D AGP graphics controller into the north bridge of the chipset. Packed with features, the controller incorporates a 64-bit 2D/3D graphics engine and video accelerator with advanced DVD video and optional TV output capability. The controller supports Win-95 and Win-98 / NT5 miniport drivers.

The Apollo MVP4 is paired with the VIA VT82C686A south bridge. Highly advanced, the south bridge combines an integrated 2D/3D engine with DVD hardware acceleration, AC-97 audio support for SoundBlaster Pro and FM synthesis legacy audio.

1.1 Graphics Features

- AGP 2.0 --Compliant
- 64-bit 2D/3D graphics engine and video accelerator
- DVD hardware accelerator

1.2 Audio Features

- AC'97 audio support for SoundBlaster Pro
- FM synthesis legacy audio

1.3 System Requirements

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

Computer	Intel® Pentium™ processor
	AMD® K6/K6-2/K6-III processor
	Cyrix® MX/MII processor
Monitor	VGA Support, mimimum 640x480 resolution
Operating system	DOS 5.0 or higher, Windows® 95/98, Windows® NT 3.51 or 4.0, or OS/2®
CD-ROM	Double Speed or Higher
Chipset	VIA® MVP4/VT82C686A chipset
VGA BIOS	Version 00.23 or Higher

2. Driver Setup & Usage Procedures for Windows® 98

Insert the CD-title into your CD-ROM drive. The CD will auto-run and will display the four icons in the monitor "VIA Chipset Drivers", "VIA AC97 PCI Sound Drivers", "VIA Enhance VGA Drivers" and "Download VIA Drivers". In order to install the drivers correctly, you must install the "Via Chipset Drivers" first, and then install the "VIA AC97 PCI Sound Drivers" or "VIA Enhance VGA Drivers".

2.1 VIA Chipset Drivers 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 "Via Chipset Drivers" icon and the screen will show "VIA Service Pack 4.05".

Step 4: Click "Next" and the screen will show three drivers "Bus Master PCI IDE Driver", "AGP VxD Driver" and "VIA Chipset Function's Registry". Select all three drivers and click on "Next".

Step 5: The setup program will request you to choose "Install", "Uninstall" or "Enable/Disable (Ultra) DMA for IDE driver". Please select "Install" and click "Next" to continue.

Step 6: The setup program will request you to choose "Install VIA AGP VxD in turbo mode", "Install VIA AGP VxD in normal mode" or "Uninstall VIA AGP VxD". Please select "Install VIA AGP VxD in turbo mode" and click on "Next".

Step 7: The setup program will let you choose between "Install VIA Chipset Functions Registry" or "Uninstall VIA Chipset Functions Registry". Please select "Install VIA Chipset Functions Registry" and then click "Next".

Step 8: The setup program will request you to choose whether to restart the computer or not. Please select "Yes, I want to restart my computer now" and click Finish. The computer will restart and finish the VIA Chipset Drivers installation.

2.2   VIA AC97 PCI Sound Drivers 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 "VIA AC97 PCI Sound Drivers" icon and the screen will show "VIA AC97 PCI Sound Drivers".

Step 4:   Click "Next" to proceed and the screen will show "Install", or "Remove". Select "Install" and then click on "Next".

Step 5:   The setup program will request you to choose whether to restart the computer or not. Please select "Yes, I want to restart my computer now" and click Finish. The computer will restart and finish the AC97 Audio Drivers Installation.

2.3   VIA Enhance VGA Drivers Installation Procedures

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 "VIA Enhance VGA Drivers" icon and click "Next".

Step 4:   The setup program will request you to choose whether to restart the computer or not. Please select "Yes, I want to restart my computer now" and click Finish. The computer will restart and finish the VGA Chipset Drivers installation.

2.4   Change the display resolution and color

Step 1:   Click the "Start" icon at the left button of the screen.

Step 2:   Select "Settings" then "Control Panel". Click on "Control Panel".

Step 3:   Double click the "Display" icon and the screen will show "Display Properties" setting screen.

Step 4:   Click the "Settings" icon to change the display resolution and color. Click "OK" when you finish setting the resolution and color.

Note: If you wish to have a good 3D graphic quality, please install the Direct X 6.

2.5   Enable the Ultra DMA Driver for IDE Driver

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 the "VIA Chipset Drivers" icon and the screen will show "VIA Service Pack 4.05".

Step 4: Click "Next" and the screen will show three drivers: "Bus Master PCI IDE Drivers", "AGP VxD Drivers" and "VIA Chipset Function's Registry". Select the "Bus Master PCI IDE Drivers" icon and click "Next".

Step 5: The setup program will request you to choose "Install", "Uninstall" or "Enable/Disable (Ultra) DMA for IDE driver". Please select "Enable/Disable (Ultra) DMA for IDE driver" and click "Next" to continue.

Step 6: The setup program will show the hard drive DMA mode, please click "Next".

Step 7: The setup program will request you to choose whether to restart the computer or not. Please select "Yes, I want to restart my computer now" and click Finish. The computer will restart and finish the (Ultra) DMA Enable for IDE Master.

3. Windows® NT 4.0

Install Windows® NT 4.0 Service Pack 3 or the latest version before installing the VIA drivers.

Insert the CD-title in the CD-ROM drive. The CD will auto-run and will display four icons on the screen "VIA Chipset Drivers", "VIA AC97 PCI Sound Drivers", "VIA Enhance VGA Drivers" and "Download VIA Drivers". In order to install the drivers properly, install the "VIA Chip Drivers" first and then install the "VIA AC97 PCI Sound Drivers" or "VIA Enhance VGA Drivers".

3.1 VIA Chipset Drivers 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 "VIA Chipset Drivers" icon and the screen will show "VIA Service Pack 4.05".

Step 4: Click "Next" to proceed and the screen will show "Install", "Uninstall" or "Enable/Disable Ultra DMA for IDE Driver". Select "Install" and then click on "Next".

Step 5: The setup program will show the following on the screen: "To complete this installation, follow this steps"
1. Select the "SCSI Adapters" icon on the "Control Panel".
2. Select the "Add.." button on the "Drivers" sheet.
3. Select the "VIA Bus Master IDE Drivers" and click the "OK" button
4. Reboot
   Please click "Next" to exit the setup program.

Step 6: Follow the steps shown in **Step 5** to finish the VIA Chipset Drivers installation.

3.2 VIA AC97 PCI Sound Drivers 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 "VIA AC97 PCI Sound Drivers" icon and the screen will
          show the "VIA PCI Audio Drivers" setup screen. Click "Next" to
          continue
Step 4:   The setup program will show "Install" or "Remove" in the screen.
          Select "Install" and click "Next"
Step 5:   The setup program will show the following on the screen:

> Please choose "Add" from the next window
> and add the following device:
>   VIA AC97 PCI Audio Device
>   VIA MIDI External Port

   Then click "OK".
Step 6:   Follow the steps shown in **Step 5** to finish the VIA AC97 PCI
          Audio Drivers Installation.

3.3 VIA Enhance VGA Drivers 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 "VIA Enhance VGA Drivers" icon and the screen will
          show the "VIA Enhance VGA Drivers" setup screen. Click "Next"
          to continue.
Step 4:   The setup program will ask you whether you want to restart your
          computer now or not. Select "Yes, I want to restart my computer
          now: and click "Finish". The computer will restart and finish the
          VGA Drivers installation.
Step 5:   After restarting the system, the system will ask to change the
          display resolution and color. Select the display resolution and
          color and click "OK".

3.4 Enable the Ultra DMA for IDE Driver:

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 the "VIA Chipset Drivers" icon and the screen will show "VIA Service Pack 4.05".

Step 4: Click "Next" and the screen will show three drivers: "Bus Master PCI IDE Drivers", "AGP VxD Drivers" and "VIA Chipset Function's Registry". Select the "Bus Master PCI IDE Drivers" icon and click "Next".

Step 5: The setup program will request you to choose "Install", "Uninstall" or "Enable/Disable (Ultra) DMA for IDE driver". Please select "Enable/Disable (Ultra) DMA for IDE driver" and click "Next" to continue.

Step 6: The setup program will show the hard drive DMA mode, please click "Next".

Step 7: The setup program will request you to choose whether to restart the computer or not. Please select "Yes, I want to restart my computer now" and click Finish. The computer will restart and finish the (Ultra) DMA Enable for IDE Master.