TABLE OF CONTENT

Chapter 1

1-1 Preface

Welcome to use the TX98 mainboard. This mainboard is based on Pentium Processor PC/AT compatible system with ISA bus and PCI local bus. Also for this board including some special designs like share memory VGA on-board, ACPI/AMP power management & powerful performance and so on. We think you will enjoying your personal computer because of your right choice.

1-2 Key Feature

- **Chip set:** SiS 5598 Pentium PCI/ISA with built-in VGA single chip.
- **Support Pentium Processor:** Running at 75~300MHz Pentium CPU on a ZIF Socket 7. Support INTEL P54C, P55C(MMX), AMD-K5, AMD-K6, Cyrix/IBM 6X86, 6X86L, 6X86MX & IDT C6 etc.
- **L2 Cache:** Provides on board 256K/512K Pipelined Burst SRAM to increase system performance.
- **Memory expansion:** Support 3 Banks of DRAM from 8MB to 384MB, and supports all kind of D-RAM type including FAST PAGE D-RAM, E.D.O. D-RAM and Synchronous D-RAM.
- **ISA and PCI expansion Slots:** Provides four 16-bits ISA & four 32-bits PCI slots.
- **PCI Bus Master IDE Controller:** On-board ULTRA DMA-33 bus master IDE controller with two connectors that supports four IDE devices in two channel, provide faster data transfer rate up to 33MB/sec. This controller supports PIO mode 3 and 4 and Bus Master IDE DMA.
- **Super MULTI-I/O:** Provide two high-speed UART compatible serial ports and one extra PS/2 mouse cable including, one parallel port with EPP and ECP capabilities. Two floppy drives of either 5.25" or 3.5" (1.44MB or 2.88MB) and also supported without an external card.
- **USB IrDA Connector:** This board supports two USB ports connector and one infrared port module connector for wireless interface. (The cable connect to two USB ports and the infrared module is optional parts.)
- **Built-In High performance VGA:**
  - Built-in VGA memory selected by BIOS setup from 1MB to 4MB
  - 64 bits display memory path
  - Support 170MHz pixel clock
  - Support full motion video playback required only 1MB DRAM and up to 1024x768x256 color Mode
  - Support DCI, Direct Draw, Direct MPEG, Microsoft Video to improve play back quality
  - Support high resolution graphic modes

Chapter 2

Hardware Installation

2-1 Unpacking

This mainboard package should contain the following:

- The TX98 mainboard
- USER'S MANUAL for mainboard
- Cable set for IDE x1, Floppy x1, COM1 & COM2 x1, LPT & PS/2 Mouse x1, VGA x1
- CD for Drivers PACK

The mainboard contains sensitive electronic components which can be easily damaged by electron-static, so the mainboard should be left in its original packing until it is installed.

Unpacking and installation should be done on a grounded anti-static mat.

The operator should be wearing an anti static wristband, grounded at the same point as the anti-static mat.

Inspect the mainboard carton for obvious damage. Shipping and handling may cause damage to your board. Be sure there are no shipping and handling damages on the board before proceeding.

After opening the mainboard carton, extract the system board and place it only on a grounded anti-static surface component side up. Again inspect the board for damage.

Press down on all of the socket IC's to make sure that they are properly inserted. Do this only on with the board placed on a firm flat surface.

Warning: Do not apply power to the board if it has been damaged.

You are now ready to install your mainboard. The mounting hole pattern on the mainboard matches the IBM-AT system board.

It is assumed that the chassis is designed for a standard IBM XT/AT mainboard mounting. Place the chassis on the anti-static mat and remove the cover.

Take the plastic clips, Nylon stand-off and screws for mounting the system board, and keep them separate.

2-2 Mainboard Layout

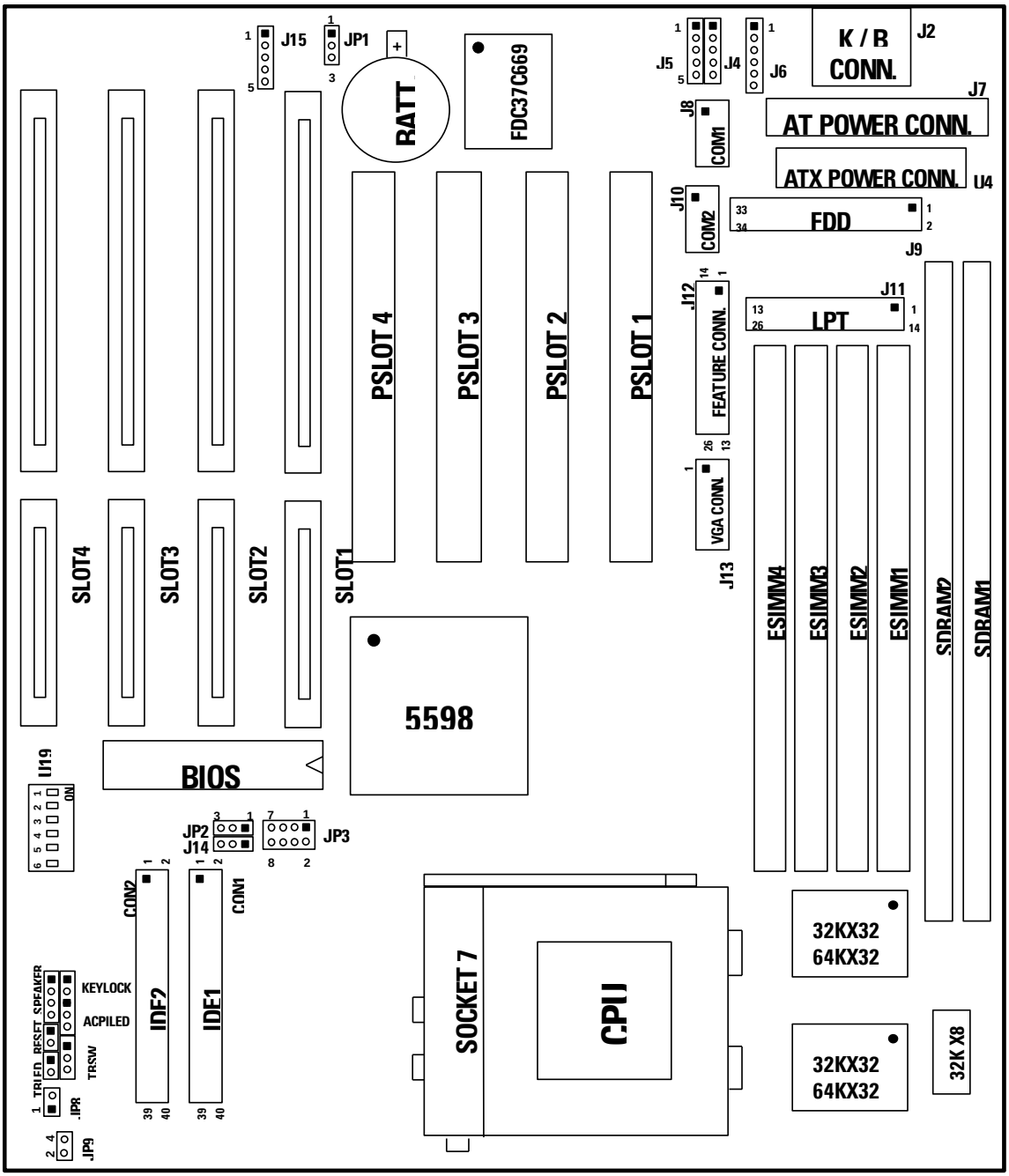


Figure 2-1

2-3 Quick Reference for Jumpers, Connectors & Expansion Socket

Jumpers

Jumper	Name	Description	Page
JP1	CMOS RAM Clear	1-2 Normal 2-3 Clear CMOS	9
JP2	FLASH ROM Voltage setting	1-2 12V FLASH ROM 2-3 5V FLASH ROM	5
JP3	CPU Voltage selector	for detail	6
JP4 (U19)	DIP switch for CPU type selection	for detail	6

Connectors

Connector	Name	Description	Page
J2	Keyboard Connector	5-Pins Female	13
J4, J5	USB Port Connector	10-Pins Block	17
J6	PS/2 Mouse Connector	6-Pins Block	13
COM1,COM2	Serial Port COMA & COMB	10-Pins Block	14
LPT	Parallel Port Connector	26-Pins Block	13
FDD	Floppy Driver Connector	34-Pins Block	14
IDE1	Primary IDE Connector	40-Pins Block	15
IDE2	Secondary IDE Connector	40-Pins Block	15
J12	Video Feature Connector	26-Pins Block	18
J13	VGA Connector	16-Pins Block	18
J14	CPU FAN Connector	1-2 12V Power Connector 2-3 ACPI FAN power control Connector	17
J15	Infrared Module Connector	5-Pins Block	17
AT-PW	AT Power Connector	12-Pins Block	12
ATX-PW	ATX Power Connector	20-Pins Block	12
FPC	Front Panel Connector	16-Pins Block	16
JP8	IDE activity LED	2-Pins Connector	16
JP9	ATX power button/soft power button	2-Pins connector	18

Expansion Sockets

Socket/Slot	Name	Description	Page
SLOT1~SLOT4	ISA Slot	16-bits ISA Bus Expansion slots	11
PSLOT1~PSLOT4	PCI Slot	32-bits PCI Local Bus Expansion slots	11
SIMM1~SIMM4	SIMM Module Socket	72-Pins SIMM D-RAM Module Expansion Socket	10
SDRAM1, SDRAM2	DIMM Module Socket	168-Pins DIMM SDRAM Module Expansion Socket	10
ZIF SOCKET 7	CPU Socket	Pentium CPU Socket	10

2-4 Installation Steps

Before using your computer, you must follow the steps as follows:

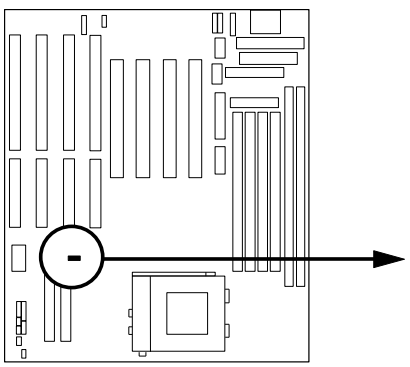
1. Set Jumpers on the Motherboard
2. Install the CPU
3. Install DRAM Modules
4. Install Expansion card
5. Connect Cables, Wires, and Power Supply

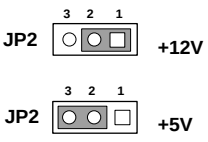
2-5 Jumper Settings

1. Flash ROM Voltage Selection: JP2 (Yellow color selector)

This jumper set the voltage supplied to the Flash ROM. It depend on Flash ROM Brand, for this jumper will be setted by factory, you don't need to change this jumper by yourself.

Programming	**JP2**	
+12V	1-2	(Intel, MXIC)
+5V	2-3	(SST, Winbond, Atmel)





Flash ROM Voltage Selection

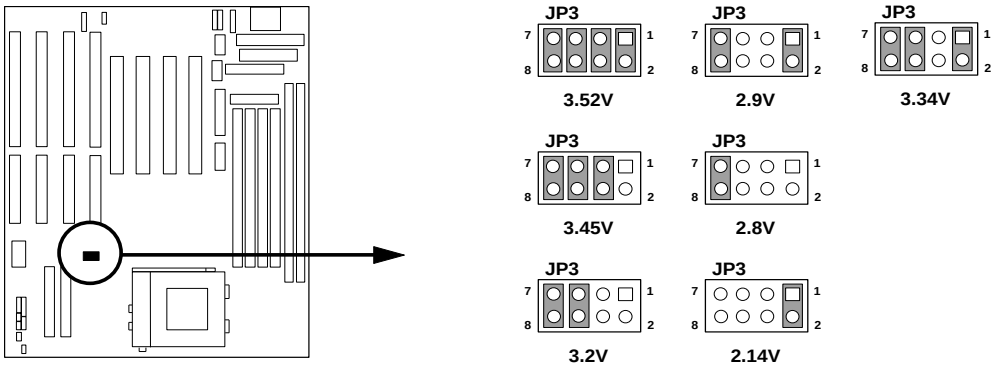
2. CPU Voltage Selection: JP3 (Yellow color selector)

This jumper is used for adjusting CPU working voltage, for this main board design it can auto detect the single voltage CPU or dual voltage CPU.

The table of JP3 CPU voltage selection (O: open, S: short)

CPU TYPE	Voltage	1-2	3-4	5-6	7-8	Default
Intel Pentium single Voltage P54VRE AMD single Voltage K5 Cyrix/IBM single Voltage 6X86 IDT-C6 150/180/200	3.52V	S	S	S	S	
Intel Pentium single Voltage P54STD	3.45V	O	S	S	S	
AMD K6/MMX Dual Voltage K6-PR233	3.2V	O	O	S	S	
AMD K6/MMX Dual Voltage K6-PR166/200 Cyrix/IBM Dual Voltage (MX 166/200)	2.9V	S	O	O	S	
Cyrix/IBM Dual Voltage 6X86L $166^{+}/200^{+}$ Intel/MMX Dual Voltage (P55C,166/200/233)	2.8V	O	O	O	S	*

* ***If your CPU Type is not including in above table, please refer to the CPU voltage selection on below to choose the correct working voltage for your CPU.***



CPU Voltage Selection

3. CPU Type selection: JP4 (6-Pins DIP Switch)

This mainboard design use 6-pins DIP switch to select the CPU, external clock frequency & Bus frequency ratio, and the external clock frequency multiplied by Bus frequency ratio is the CPU frequency as the tables below:

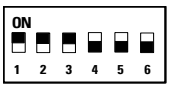
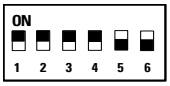
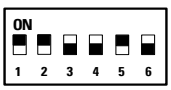
Table for CPU external clock frequency

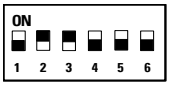
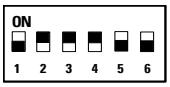
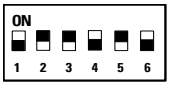
DIP SWITCH 1	DIP SWITCH 2	DIP SWITCH 3	External clock frequency
ON	ON	ON	50MHz
ON	OFF	ON	55MHz
ON	ON	OFF	60MHz
OFF	ON	ON	66.6MHz
ON	OFF	OFF	75MHz
OFF	OFF	ON	83.3MHz

Table for Bus frequency Clock Ratio

DIP SWITCH 4	DIP SWITCH 5	DIP SWITCH 6	Clock Ratio
OFF	OFF	OFF	1.5
ON	OFF	OFF	2.0
ON	ON	OFF	2.5
OFF	ON	OFF	3.0
OFF	OFF	OFF	3.5
ON	OFF	ON	4.0
ON	ON	ON	4.5

Table for CPU Type selection (■: ON, ▬: OFF)

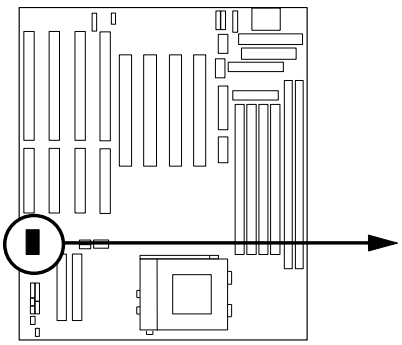
CPU Type	DIP Switch Setting	DIP Switch (1,2,3) External clock frequency	DIP Switch (4,5,6) Clock Ratio	External clock frequency × Ratio = CPU frequency
Intel P54C-75MHz AMD K5-75MHz		50MHz	1.5	75MHz
Cyrix/IBM 6X86-120+		50MHz	2	100MHz
C6-150MHz		50MHz	3	150MHz
Cyrix/IBM 6X86-133+		55MHz	2	110MHz
Intel P54C-90MHz AMD K5-PR90		60MHz	1.5	90MHz
Intel P54C-120MHz Cyrix/IBM 6X86-150+		60MHz	2	120MHz
Intel P54C-150MHz Cyrix/IBM 6X86MX-PR166		60MHz	2.5	150MHz
C6-180MHz		60MHz	3	180MHz

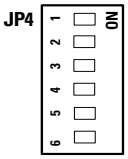
CPU Type	DIP Switch Setting	DIP Switch (1,2,3) External clock frequency	DIP Switch (4,5,6) Clock Ratio	External clock frequency × Ratio = CPU frequency
Intel P54C-100MHz AMD K5-PR100 AMD K5-PR133		66MHz	1.5	100MHz
Intel P54C-133MHz Cyrix/IBM 6X86-166+		2	66MHz	133MHz
Intel P54C-166MHz Intel P55C-166MHz (MMX) Cyrix 6X86MX-PR166 AMD K5-PR166 AMD K6-PR166		2.5	66MHz	166MHz
Intel P54C-200MHz Intel P55C-200MHz (MMX) Cyrix 6X86MX-PR233 AMD K6-PR200 C6-200MHz		3	66MHz	200MHz
Intel P55C-233MHz (MMX) AMD K6-PR2-233		3.5	66MHz	233MHz
AMD K6-PR2-266		4	66MHz	266MHz
AMD K6-PR2-300		4.5	66MHz	300MHz

NOTE: ***Before installing the CPU, Please check the CPU Frequency and Clock Ratio from your supplier.***

For Cyrix/IBM 6X86MX series, please double check the CPU's Frequency and Clock Ratio.

75MHz/83.3MHz CPU's Bus Frequency is not in the reqular specification, therefore, we do not recommend to use it.





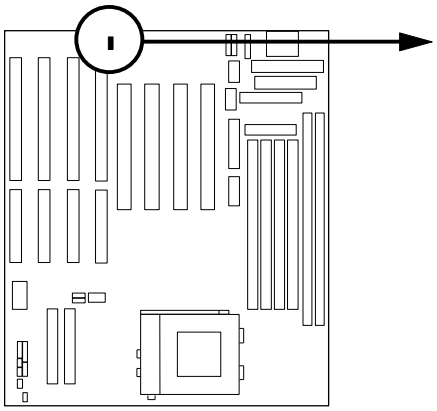
DIP Switch for CPU Type

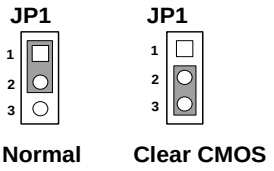
4. CMOS RAM Clear: JP1 (Yellow color selector)

WARNING: Make sure your computer is POWER OFF when you CLEAR CMOS.

Connect a jumper Cap over this jumper for a few seconds, will clears information stored in the CMOS RAM Chip that input by user, such as hard disk information and passwords. After CLEAR CMOS, you must enter the BIOS setup (by holding down <DEL> during power-up) to re-enter BIOS information (see BIOS SETUP).

Selections	**JP1**	
Normal	1-2	(Default)
Clear CMOS	2-3	(momentarily)





CMOS RAM (Normal / Clear CMOS Data)

2-6 System Memory (DRAM)

This main board can be installed with 72 pin SIMM module DRAM, or 168 pins DIMM module synchronous DRAM. The DRAM memory system on main board consists of BANK 0 & BANK 1, for 72 pin SIMM socket was defined to be BANK 0, BANK1 and SDRAM1 & SDRAM2 to be BANK 0 & BANK 2 (SIMM1, SIMM2, SIMM3 & SIMM4).

Because of the 72-pins SIMM module is 32 bits width using 2 pcs which can match a 64 bits pentium system.

Install DRAM on this main board please reference the table below.

SDRAM1 BANK 0	SDRAM2 BANK 2	SIMM1, SIMM2 BANK 1	SIMM3, SIMM4 BANK 0	System can be Accept or not
×	×	×	72 Pin FPM or EDO SIMM	Accept
×	×	72 Pin FPM or EDO SIMM	72 Pin FPM or EDO SIMM	Accept
×	168 Pin S-DRAM DIMM	72 Pin FPM or EDO SIMM	72 Pin FPM or EDO SIMM	Not Accept
168 Pin S-DRAM DIMM	168 Pin S-DRAM DIMM	72 Pin FPM or EDO SIMM	72 Pin FPM or EDO SIMM	Not Accept
168 Pin S-DRAM DIMM	×	×	×	Accept
168 Pin S-DRAM DIMM	168 Pin S-DRAM DIMM	×	×	Accept
168 Pin S-DRAM DIMM	168 Pin S-DRAM DIMM	72 Pin FPM or EDO SIMM	×	Not Accept
168 Pin S-DRAM DIMM	168 Pin S-DRAM DIMM	×	72 Pin FPM or EDO SIMM	Not Accept
168 Pin S-DRAM DIMM	×	72 Pin FPM or EDO SIMM	×	Not Accept

* ***SIMM module can't combine with DIMM Module.***

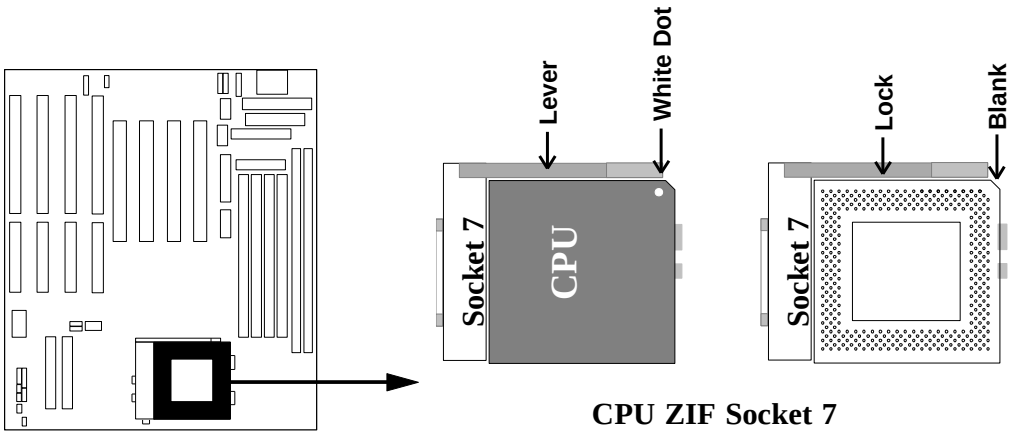
2-7 Central Processing Unit (CPU)

The main board provides a 321-pins ZIF Socket 7. The CPU on mother board must have a fan attached to prevent overheating.

WARNING: Without a fan, the CPU will be overheated and cause damage to both the CPU and the motherboard.

To install a CPU, first turn off your system and remove its cover. Locate the ZIF socket and open it by first pulling the lever sideways away from the socket then upwards to a 90-degree right angle. Insert the CPU with the white dot as your guide. The white dot should point towards the end of the level. The CPU has a corner pin for three of the four corners, the CPU will only fit in the one orientation as shown as follow. With the added weight of the CPU fan, no force is required to insert the CPU. Once completely inserted, hold down on the fan and close the socket's lever.

IMPORTANT: ***You must set jumpers JP4 "DIP Switch for CPU Type" on page 7 and jumper JP3 "CPU Voltage Selection" on page 7 depending on the CPU that you install.***



CPU ZIF Socket 7

2-8 Expansion Cards

First read your expansion card documentation on any hardware and software settings that may be required to setup your specific card.

Installation Procedure:

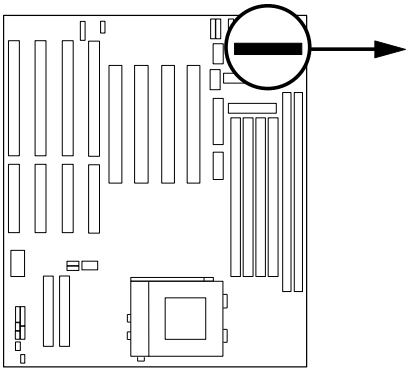
1. Read the documentation for your expansion card.
2. Set any necessary jumpers on your expansion card.
3. Remove your computer's cover.
4. Remove the bracket on the slot you intend to use.
5. Carefully align the card's connectors and press firmly.
6. Secure the card on the slot with the screw you remove in step 4.
7. Replace the computer's cover.
8. Setup the BIOS if necessary.
9. Install the necessary software drivers for your expansion card.

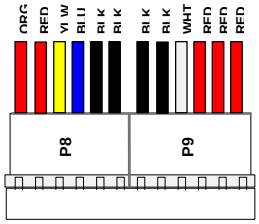
2-9 External Connectors

1. Power connector: AT Power Connector (12-pins block): AT-PW

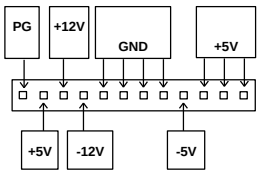
This connector connects to a standard AT power supply. To connect the leads from the power supply, ensure first that the power supply is not plugged. Most power supplies provide two plugs (P8 and P9), each containing six wires, two of which are black. Orient the connectors so that the black wires are located in the middle.

Using a slight angle, align the plastic guide pins on the lead to their receptacles on the connector. Once aligned, press the lead onto the connector until the lead locks into place.





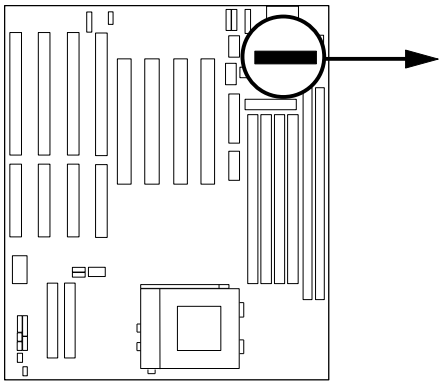
Power Plugs from Power Supply

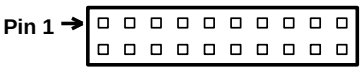


Power Connector on Motherboard

2. Power Connector: ATX Power Connector (20-pins block): ATX-PW

ATX Power Supply connector. This is a new defined 20-pins connector that usually comes with ATX case. The ATX Power Supply allows to use soft power on momentary switch that connect from the front panel switch to 2-pins Power On jumper pole on the motherboard. When the power switch on the back of the ATX power supply turned on, the full power will not come into the system board until the front panel switch is momentarily pressed. Press this switch again will turn off the power to the system board.



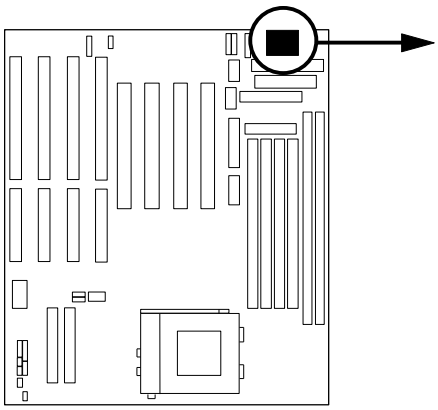


PIN	ROW2	ROW1
1	3.3V	3.3V
2	-12V	3.3V
3	GND	GND
4	Soft Power On	5V
5	GND	GND
6	GND	5V
7	GND	GND
8	-5V	Power OK
9	+5V	+5V (for Soft Logic)
10	+5V	+12V

ATX Power Connector

3. Keyboard Connector (5-pins female): J2

This connection is for a standard IBM-compatible keyboard. May also be known as a 101 enhanced keyboard.

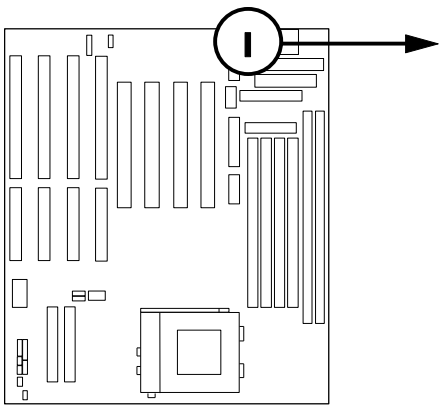


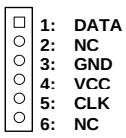
Keyboard Connector (5-pins female)

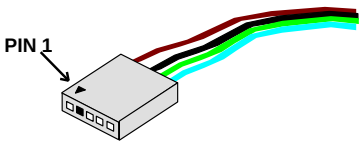
Connector Plug from Keyboard

4. PS/2 Mouse Connector (6-pins block): J6

If you are using a PS/2 mouse, you must purchase an optional PS/2 mouse set which connects to the 6-pins block and mounts to an open slot on your computer's case.





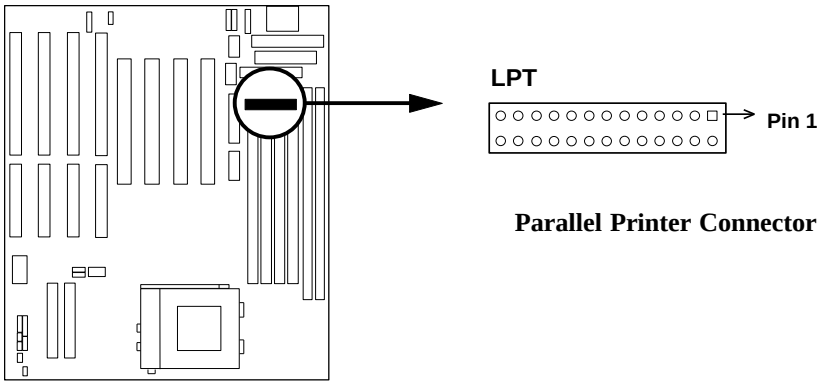


PS/2 Mouse Module Connector

5. Parallel Printer Connector (26-pins Block): LPT

Connection for the enclosed parallel port ribbon cable with mounting bracket. Connect the ribbon cable to this connection and mount the bracket to the case on an open slot. It will then be available for a parallel printer cable.

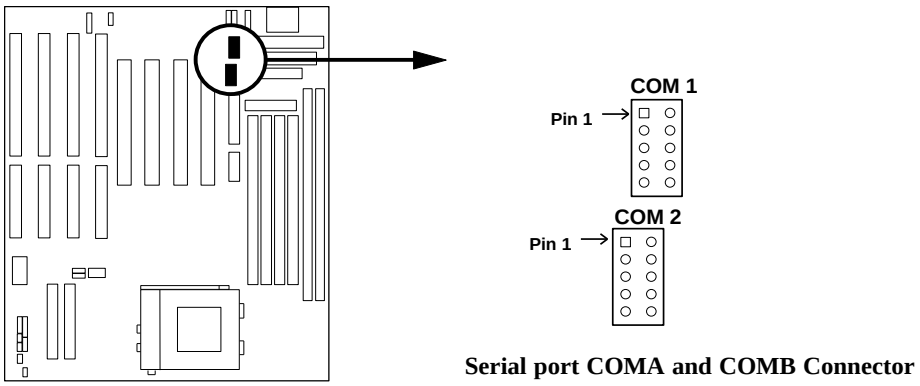
NOTE: Serial printers must be connected to the serial port. You can enable the parallel port and choose the IRQ through BIOS Setup.



Parallel Printer Connector

6. Serial port COMA and COMB Connector (Two 10-pins blocks): COM1, COM2

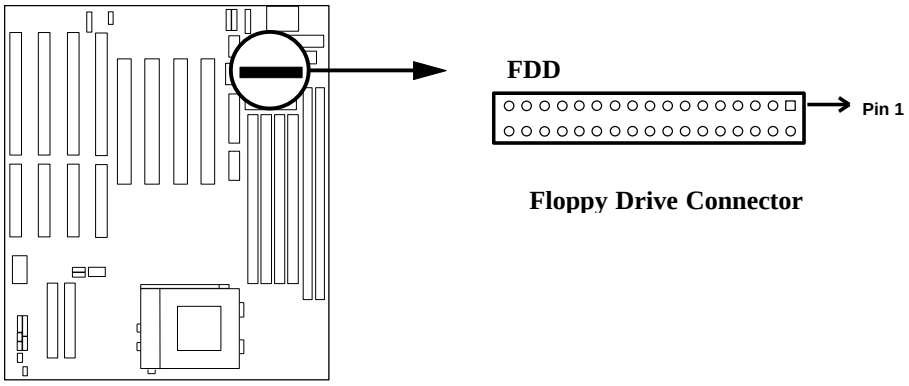
These connectors support the provided serial port ribbon cables with mounting bracket. Connect the ribbon cables to these connectors and mount the bracket to the case on an open slot. The two serial ports on the mounting bracket will then be used for pointing devices or other serial devices. See BIOS configuration of "Onboard Serial Port"



Serial port COMA and COMB Connector

7. Floppy drive Connector (34-pins block): FDD

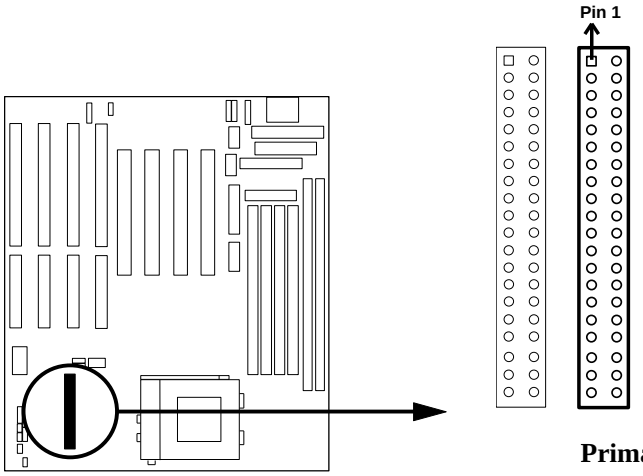
This connector supports the provided floppy drive ribbon cable. After connecting the single plug end to motherboard, connect the two plugs at other end to the floppy drives.



Floppy Drive Connector

8. Primary IDE Connector (40-pins block): IDE1

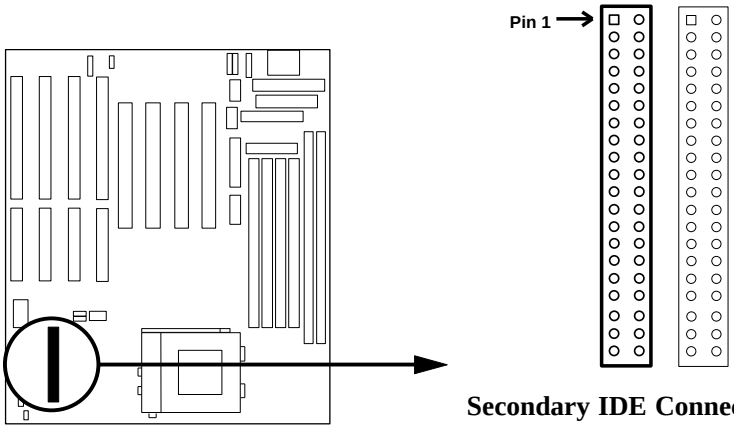
This connector supports the provided IDE hard disk ribbon cable. After connecting the single plug end to motherboard, connect the two plugs at other end to your hard disk(s). If you install two hard disks, you must configure the second drive to Slave mode by setting its jumpers accordingly. Please refer to the documentation of your hard disk for the jumper settings.



Primary IDE Connector

9. Secondary IDE Connector (40-pins block): IDE2

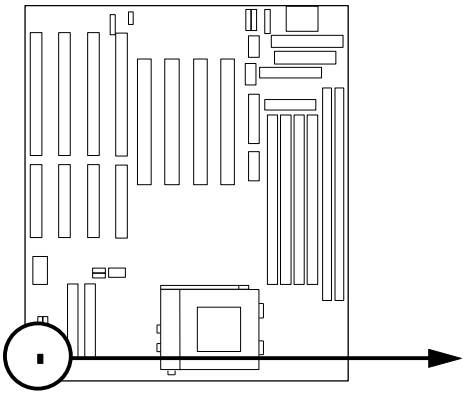
This connector connects to the next set of Master and Slave hard disks. Follow the same procedure described for the primary IDE connector. You may also configure two hard disks to be both Masters using one ribbon cable on the primary IDE connector and another ribbon cable on the secondary IDE connector.

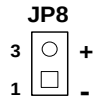


Secondary IDE Connector

10. IDE activity LED: JP8

This connector connects to the hard disk activity indicator light on the case.





IDE (Hard Drive) LED

11. Front Panel connector: This 16-pins connector to connect to case front panel switch.

A. Turbo LED switch: TBLED

The motherboard's turbo function is always on. The turbo LED will remain constantly lit while the system power is on. You may also to connect the Power LED from the system case to this lead. See the figure below.

B. Reset switch lead: RESET

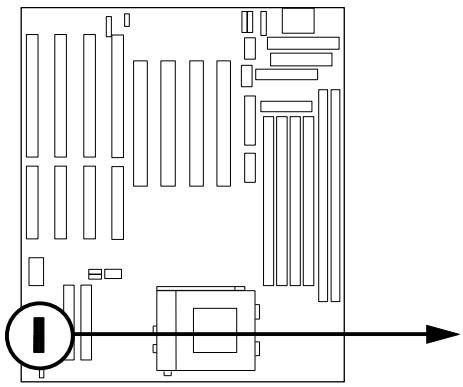
This 2-pin connector connects to the case-mounted reset switch for rebooting your computer without having to turn off your power switch. This is a preferred method of rebooting in order to prolong the life of the system's power supply. See the figure below.

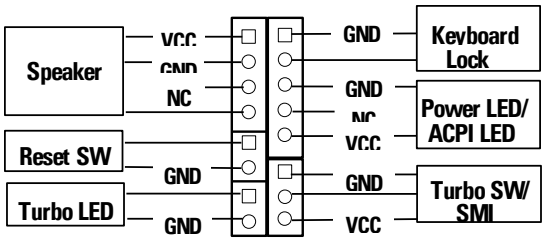
C. Keyboard lock switch lead & Power LED: KEYLOCK & PW

This 5-pin connector connects to the case-mounted key switch for locking the keyboard for security purposes and Power LED together.

D. Speaker connector: SPEAKER

This 4-pin connector connects to the case-mounted speaker. See the figure below.

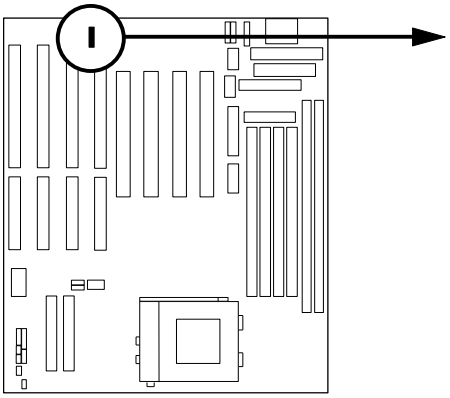


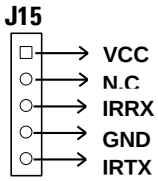


System Case Connections

12. IR infrared module connector: J15

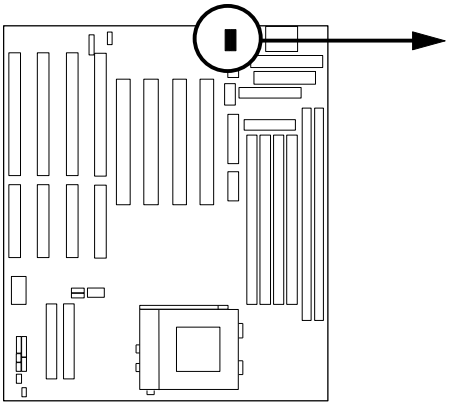
This connector supports the optional wireless transmitting and receiving infrared module. This module mounts to small opening on system cases that support this feature you must also configure the setting through BIOS setup. Use the five pins as shown on the Back View and connect a ribbon cable from the module to the motherboard according to the pin definitions.

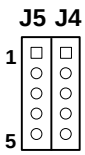




Infrared Module Connector

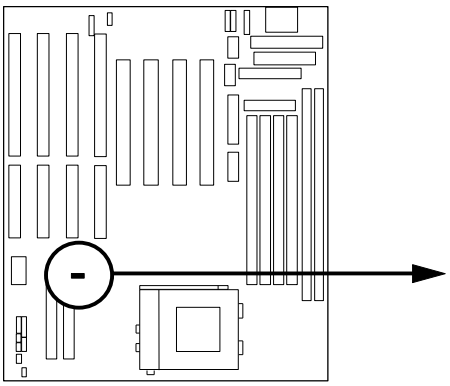
13. USB Port connector: USB0 (J4)/ USB1 (J5)

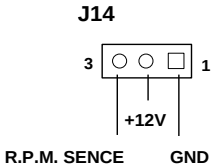




USB Port connector

14. CPU FAN connector: J14

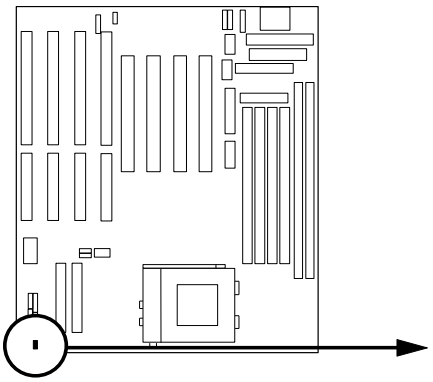




CPU Fan Connector

15. ATX Power button/ Soft Power button: JP9

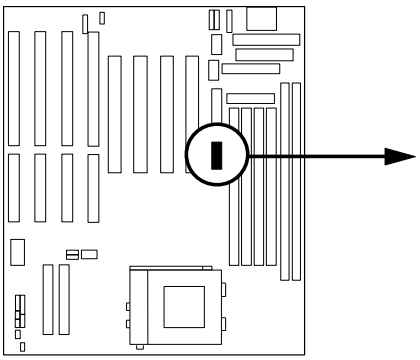
When using ATX power, the system power can be controlled by a momentary switch connected to JP9 Pushing the button once will switch the system between ON and SLEEP. Pushing the switch while in the ON mode more than 4 seconds will turn the system off. The system Power LED shows the status of the system's power.

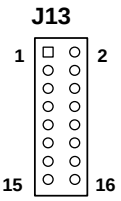


ATX Power button/Soft Power button

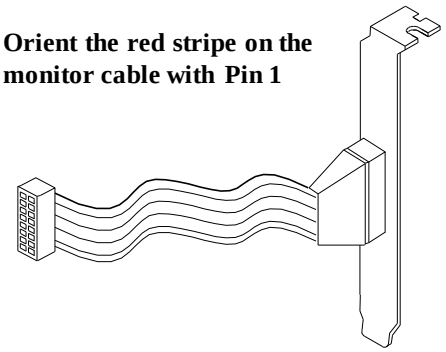
16. VGA connector: J13

This connector supports the provided VGA cable with mounting bracket. Connect the ribbon cable to connector and mount the bracket to the case on an open slot .

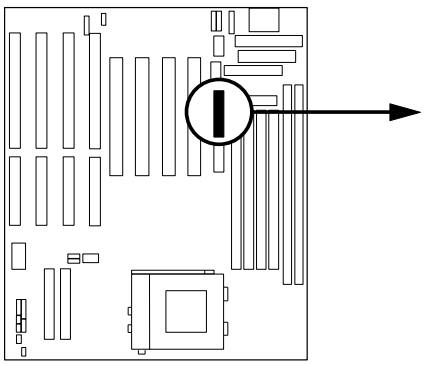


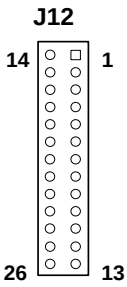


VGA Connector



17. Video Feature connector: J12





Video Feature Connector

Chapter 3

AWARD BIOS SETUP

Award's ROM BIOS provides a built-in Setup program which allows user modify the basic system configuration and hardware parameters. The modified data will be stored in a battery-backed CMOS RAM so data will be retained even when the power is turned off. In general, the information saved in the CMOS RAM stay unchanged unless here is configuration change in the system, such as hard drive replacement or new equipment is installed.

It is possible that CMOS had a battery failure which cause data lose in CMOS-RAM. If so, re-enter system configuration parameters become necessary.

To enter Setup Program

Power on the computer and press **<Del>** key immediately will bring you into BIOS **CMOS SETUP UTILITY**.

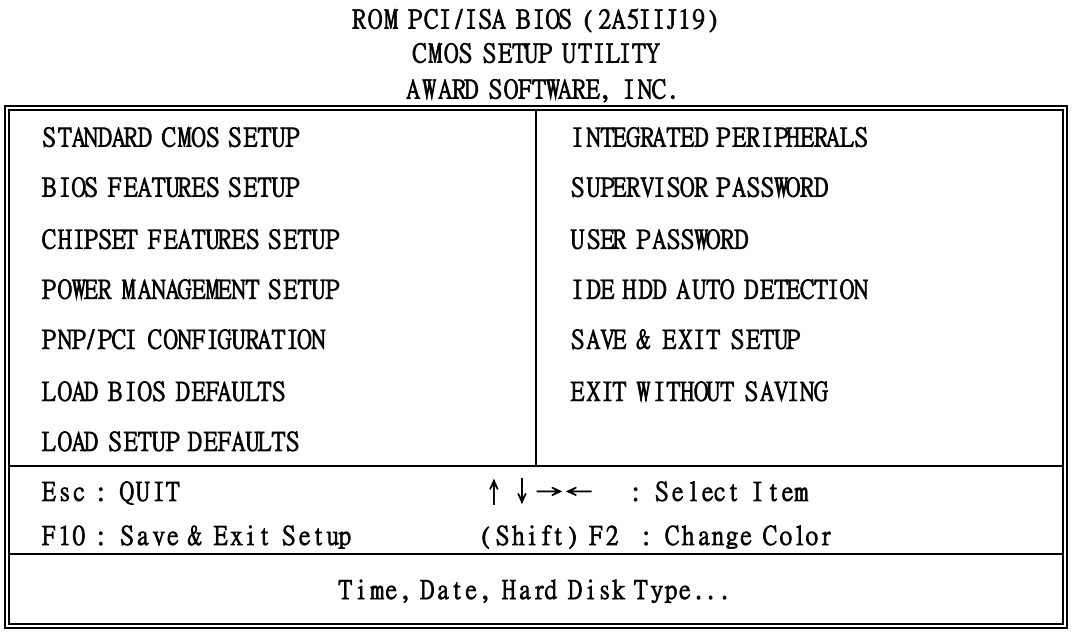


Figure 3-1

The menu displays all the major selection items and allow user to select any one of shown item. The selection is made by moving cursor (press any direction key) to the item and press <Enter> key. An on_line help message is displayed at the bottom of the screen as cursor is moving to various items which provides user better understanding of each function. When a selection is made, the menu of selected item will appear so the user can modify associated configuration parameters.

3-1 STANDARD CMOS SETUP

Choose "**STANDARD CMOS SETUP**" in the CMOS SETUP UTILITY Menu (Figure 3-1). The STANDARD CMOS SETUP allows user to configure system setting such as current date and time, type of hard disk drive installed in the system, floppy drive type, and the type of display monitor. Memory size is auto_detected by the BIOS and displayed for your reference. When a field is highlighted (direction keys to move cursor and <Enter> key to select), the entries in the field will be changed by pressing <PgDn> or <PgUp> keys or user can enter new data directly from the keyboard.

ROM PCI/ISA BIOS (2A5IIJ19)
STANDARD CMOS SETUP
AWARD SOFTWARE, INC.

Date (mm:dd:yy) : Thu, Oct, 30 1997
Time (hh:mm:ss) : 13 : 36 : 16

HARD DISKS	TYPE	SIZE	CYLS	HEAD	PRECOMP	LANDZ	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 : 1.2M , 5.25 in.
Drive B : None

Video : EGA/VGA
Halt On : All Errors

Base Memory : 640K
Extended Memory : 7168K
Other Memory : 384K

Total Memory : 8192K

Esc : Quit ↑ ↓ → ← : Select Item Pu/Pd/+/- : Modify
F1 : Help (Shift)F2: Change Color

Figure 3-2

NOTE: ***If hard disk Primary Master/Slave and Secondary Master/Slave were used Auto, than the hard disk size and model will be auto-detect on display during POST.***

NOTE: ***The "Halt On:" field is to determine when to halt the system by the BIOS is error occurred during POST.***

3-2 BIOS FEATURES SETUP

Select the "**BIOS FEATURES SETUP**" option in the CMOS SETUP UTILITY menu allows user to change system related parameters in the displayed menu. This menu shows all of the manufacturer's default values of this motherboard. Again, user can move the cursor by pressing direction keys and <PgDn> of <PgUp> keys to modify the parameters. Pressing [F1] key to display help message of the selected item.

This setup program also provide 2 convinent ways to load the default parameter data from BIOS [F6] or CMOS [F7] area if shown data is corrupted. This provides the system a capability to recover from any possible error.

ROM PCI/ISA BIOS (2A5IIJ19)
BIOS FEATURES SETUP
AWARD SOFTWARE, INC.

Virus Warning	: 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	: Disabled	D0000-D3FFF Shadow	: Disabled
Boot Sequence	: A,C,SCSI	D4000-D7FFF Shadow	: Disabled
Swap Floppy Drive	: Disabled	D8000-DBFFF Shadow	: Disabled
Boot Up Floppy Seek	: Enabled	DC000-DFFFF Shadow	: Disabled
Boot Up NumLock Status	: On		
Boot Up System Speed	: High		
Gate A20 Option	: Fast		
Memory Parity Check	: Enabled		
Typematic Rate Setting	: Disabled		
Typematic Rate (Chars/Sec)	: 6		
Typematic Delay (Msec)	: 250		
Security Option	: Setup		
PCI/VGA Palette Snoop	: Disabled	Esc: Quit ↑ ↓ → ← : Select Item	
OS Select For DRAM > 64MB	: Non-OS2	F1 : Help Pu/Pd/+/-:Modify	
		F5 : Old Values (Shift)F2 : Color	
		F6 : Load BIOS Defaults	
		F7 : Load Setup Defaults	

Figure 3-3

Note: ***The Security Option contains "setup" and "system". The "setup" indicates that the password setting is for CMOS only while the "system" indicates the password setting is for both CMOS and system boot up procedure.***

- **Virus Warning:** This category flashes on the screen. 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, in the mean time, you can run an anti-virus program to locate the problem. Default value is Disabled.

  ***Enabled*:** Activates automatically when the system boots up causing a warning message to appear when anything attempts to access the boot sector or hard disk partition table.

  ***Disabled*:** No warning message to appear when anything attempts to access the boot sector or hard disk partition table.

- **CPU Internal Cache / External Cache:** These two categories speed up memory access. However, it depends on CPU/chipset design. The default value is Enable. If your CPU without Internal Cache then this item "CPU Internal Cache" will not be show.

  Enabled: Enable this category speeds up Power On Self Test. (POST) after you power on the computer.

  Disabled: Disable cache

- **Quick Power On Self Test:** If it is set to Enable, BIOS will shorten or skip some check items during POST.

  ***Enabled*:** Enable quick POST

  ***Disabled*:** Normal POST

- **Boot Sequence:** This category determines which drive computer searches first for the DOS (Disk Operating System). Default value is A,C,SCSI. System will first search for floppy disk drive, then hard disk drive and then SCSI device. The options are: C, A, SCSI; C, CDROM, A; CDROM, C, A; D, A, SCSI; E, A, SCSI; F, A, SCSI; SCSI, A, C; SCSI, C, A; C only; LS/ZIP, C.

- **Swap Floppy Drive:** The swap floppy drive. Default value is Disabled.

  ***Enabled*:** Floppy A & B will be swapped under the DOS

  ***Disabled*:** Floppy A & B will be not swap

- **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 760K, 1.2M and 1.44M are all 80 tracks. The default value is Enabled.

  Enabled: BIOS searches for floppy disk drive to determine if it is 40 or 80 tracks.
  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.
Note that there will not be any warning message if the drive installed is 360K.

- **Boot Up NumLock Status:** The default value is On.
  On: Keypad is number keys.
  Off: Keypad is arrow keys.

- **Boot UP System Speed:** It selects the default system speed-the speed that the system will run at immediately after power up.
  ***High*:** Set the speed to high.
  ***Low*:** Set the speed to low.

NOTE: The board default value is LOW in the field. Boot the system to controller turbo or De-turbo by Onboard (Turbo Switch).

- **Gate A20 Option:** The default value is Fast.
  ***Normal*:** The A20 signal is controlled by keyboard controller or chipset hardware.
  ***Fast*:** Default: Fast. The A20 signal is controlled by Port 92 or chipset specific method.

- **Memory Parity Check:** The default setting is Disable.
  ***Enable*:** Allows system to check memory's parity.

- **Typematic Rate Setting:** This determines the typematic rate.
  ***Enabled*:** Enable typematic rate and typematic delay programming.
  ***Disabled*:** Disable typematic rate and typematic delay programming. The system BIOS will use default value of this 2 items and the default is controlled by keyboard.

- **Typematic Rate (Chars/Sec):**

6 : 6 characters per second	8 : 8 characters per second
10 : 10 characters per second	12 : 12 characters per second
15 : 15 characters per second	20 : 20 characters per second
24 : 24 characters per second	30 : 30 characters per second

- **Typematic Delay (Msec):** When holding a key, the time between the first and second character displayed.

250 : 250 msec
500 : 500 msec
750 : 750 msec
1000 : 1000 msec

- **Security Option:** This category allows you to limit access to the system and Setup, or just to Setup. The default value is Setup.

  ***System*:** The system will not boot and access to Setup utility if the correct password is not entered at the prompt.

  ***Setup*:** The system will boot, but access to Setup utility if the incorrect password is entered at the prompt.

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

- **PCI/VGA Palette Snoop:** Some display cards that are non-standard VGA such as graphics accelerators or MPEG Video Cards may not show colors properly. The setting *Enabled* should correct this problem. Otherwise leave this on the setup default setting of ***Disabled***.

- **OS Select For DRAM > 64MB:** When using OS2 operating systems with installed DRAM of greater than 64MB, you need to *OS2* this option otherwise leave this on the setup default of ***Non-OS2***.

- **Video BIOS Shadow:** It determines whether video BIOS will be copied to RAM, however, it is optional from chipset design. Video Shadow will increase the video speed.

  ***Enabled*:** Video shadow is enabled

  ***Disabled*:** Video shadow is disabled

- C8000 - CBFFF Shadow:
  CC000 - CFFFF Shadow:
  D0000 - D3FFF Shadow:
  D4000 - D7FFF Shadow:
  D8000 - DBFFF Shadow:
  DC000 - DFFFF Shadow:

  These categories determine whether optional ROM will be copied to RAM by 16K byte or 32K byte per/unit and the size depends on chipset.

  ***Enabled*:** Optional shadow is enabled.

  ***Disabled*:** Optional shadow is disabled.

3-3 CHIPSET FEATURES SETUP

Choose the "**CHIPSET FEATURES SETUP**" in the CMOS SETUP UTILITY menu to display following menu.

ROM PCI/ISA BIOS (2A5IIJ19)
CHIPSET FEATURES SETUP
AWARD SOFTWARE, INC.

Auto Configuration : Enabled	CPU to PCI Post Write : 4T
	CPU to PCI Burst Mem. WR : Disabled
L2 (WB) Tag Bit Length : 8bits	ISA Bus Clock Frequency : PCICLK/3
SRAM Back-to-Back : Enabled	System BIOS Cacheable : Enabled
NA# Enable : Enabled	Video BIOS Cacheable : Enabled
Starting Point of Paging : 1T	Memory Hole At 15M-16M : Disabled
Refresh Cycle Time (us) : 15.6	VGA Shared Memory Size : 1 MB
RAS Pulse Width Refresh : 4T	VGA Memory Clock (MHz) : 55
RAS Precharge Time : 2T	
RAS to CAS Delay : 2T	
CAS# Pulse Width (FP) : 2T	
CAS# Pulse Width (EDO) : 1T	
RAMW# Assertion Timing : 3T	
CAS Precharge Time (FP) : 1T/2T	
CAS Precharge Time (EDO) : 1T/2T	
SDRAM CAS Latency : 3T	
SDRAM WR Retire Rate : X-2-2-2	
SDRAM Wait State Control : 1WS	
Enhanced Memory Write : Disabled	
Read Prefetch Memory RD : Enabled	
	Esc: Quit ↑ ↓ →← : Select Item
	F1 : Help Pu/Pd/+/-:Modify
	F5 : Old Values (Shift)F2 : Color
	F6 : Load BIOS Defaults
	F7 : Load Setup Defaults

Figure 3-4

- **Auto Configuration (Enabled):** When setting Enabled, the BIOS will auto setting DRAM Timing in some items, this make system more satiable and get high performance, we recommend choice setting enabled, because change the DRAM timing will occure system unstabled or can't boot up.
- **L2 (WB) Tag Bit Length (8 bits):** This item can choice the Tag RAM length 8 bits or 7 bits, the default value is 8 bits.
- **NA# Enabled (Disabled):** Default value is Disabled, when choice Enabled it can increase system performance a little.
- **Starting Point of Paging (1T):** The Timing to start the page function you can choice 1T, 2T, 4T, 8T. Default value is 1T.

- **Refresh Cycle Time (us) (15.6):** DRAM refresh cycle time, you can choice 15.6 ; 64.4; 124.8; 187.2, the default value is 15.6us.
- **RAS Pulse Width Refresh (4T):** RAS pulse width when refresh cycle you can choice 4T; 5T; 6T; 7T. Default value is 4T.
- **RAS Precharge Time (2T):** RAS signal in rising cycle precharge time you can choice 2T; 3T; 4T; 5T. Default value is 2T.
- **RAS to CAS Delay (2T):** The Timing between RAS to CAS delay you can choice 2T; 3T; 4T; 5T, the default value is 2T.
- **CAS# Pulse Width (FP) (2T):** CAS Pulse width only for Fast Page mode DRAM you can choice: 2T; 1T. Default value is 2T.
- **CAS# Pulse Width (EDO):** CAS Pulse width only for EDO DRAM, you can choice: 2T; 1T. Default value is 1T.
- **RAMW# Assertion Timing (2T):** When DRAM write assertion timing when read cycle followed by write cycle, you can choice: 3T; 2T. Default value is 2T.
- **CAS Precharge Timing (FP)/CAS Precharge Timing (EDO) (1T/2T):** CAS signal in rising cycle precharge timing, you can choice 1T; 1T/2T, (1T during burst cycle, 2T for different cycles); 2T.
- **SDRAM CAS Latency (3T):** The Timing of CAS delay in SDRAM Mode, you can choice: 3T; 2T. Default value is 3T, it depend on SDRAM

  * When using Ti 32MB (Double side) DIMM 2 pcs, please must setting SDRAM CAS Latency: 2T, to make system work stable another setting (3T) it will occur system unstable.
- **SDRAM WR Retire Rate (X-2-2-2):** When SDRAM write setting delay timing , you can choice: X-2-2-2; X-1-1-1. Default value is X-2-2-2.
- **SDRAM wait state Control (1WS):** SDRAM wait state control during Precharge command, you can choice: 1WS; 0WS. Default value is 1WS.
- **Enhanced Memory Write (Disabled):** Enhanced performance for the Memory Write and Invalidate of PCI bus command. Default value is Disabled.
- **Read Prefetch Memory RD (Enabled):** Read Prefetch for the Memory Read of PCI bus command. Default value is Enabled.
- **CPU to PCI Post Write (3T):** CPU to PCI post write rate control you can choice: 3T; 4T; Disabled. Default value is 3T.
- **CPU to PCI Burst Mem. WR (Disabled):** Default value is Disabled.
- **ISA Bus Clock Frequency (PCICLK/4):** ISA Bus Clock Frequency setting when Auto configuration is Disabled, you can choice: PCICLK/3; PCICLK/4; 7.159MHz. Default value is setting by Auto configuration.
- **System BIOS Cacheable/Video BIOS Cacheable (Enabled):** Setting system BIOS/Video BIOS Cacheable for increase performance .

- **Memory Hole at 15M-16M (Disabled):** Memory Address space form 15MB to 16MB setting to ISA expansion cards specifically using.
- **VGA Shared Memory Size (1MB):** To setting VGA shared memory size can choice: 0.5MB; 1MB; 1.5MB; 2.0MB; 2.5MB; 3.0MB, 3.5MB; 4MB.
- **VGA Memory Clock (MHz) (55):** Setting the VGA memory clock frequency can choice 40 to 70 MHz. Default value is 55MHz, we recommend using default value, because the higher memory clock frequency setting makes system unstabled.

3-4 POWER MANAGEMENT SETUP

Choose the "**POWER MANAGEMENT SETUP**" in the CMOS SETUP UTILITY to display the following screen. This menu allows user to modify the power management parameters and IRQ signals. In general, these parameters should not be changed unless it's absolutely necessary.

ROM PCI/ISA BIOS (2A5IIJ19)
POWER MANAGEMENT SETUP
AWARD SOFTWARE, INC.

Power Management : User Define	VGA Activity : Disabled
PM Control by APM : Yes	IRQ3 (COM 2) : Enabled
Video Off Option : Susp,Stby -> Off	IRQ4 (COM 1) : Enabled
Video Off Method : V/H SYNC+Blank	IRQ5 (LPT 2) : Enabled
	IRQ6 (Floppy Disk) : Enabled
Switch Function : Break/Wake	IRQ7 (LPT 1) : Enabled
Doze Speed (div by) : 2	IRQ8 (RTC Alarm) : Disabled
Stdby Speed (div by): 3	IRQ9 (IRQ2 Redir) : Enabled
Hot Key Suspend : Enabled	IRQ10 (Reserved) : Enabled
	IRQ11 (Reserved) : Enabled
** PM Timers **	IRQ12 (PS/2 Mouse) : Enabled
HDD Off After : Disabled	IRQ13 (Coprocessor) : Enabled
Doze Mode : Disabled	IRQ14 (Hard Disk) : Enabled
Standby Mode : Disabled	IRQ15 (Reserved) : Enabled
Suspend Mode : Disabled	
** PM Events **	
COM Ports Activity : Enabled	
LPT Ports Activity : Enabled	
HDD Ports Activity : Enabled	
	Esc: Quit ↑ ↓ → ←: Select Item
	F1 : Help Pu/Pd/+/-: Modify
	F5 : Old Values (Shift)F2 : Color
	F6 : Load BIOS Defaults
	F7 : Load Setup Defaults

Figure 3-5

Again, user can move the cursor by pressing direction keys to the field need to be modified and press <PgDn> or <PgUp> to alter item selection. You can only change the content of Doze Mode, Standby Mode, and Suspend Mode when the Power Management is set to 'User Define'.

3-4-1 The Description of the Power Management

This motherboard supports HDD Power Down, Doze and standby power saving functions when Intel Pentium Processor CPU is installed. The suspend function is also supported when the SMI switch is short. The detail description of these functions are provided as following:

- **Power Management mode selection:**

  ***Disabled*:** The system operates in NORMAL conditions (Non-GREEN), and the Power Management function is disabled.
  ***Max.saving*:** This mode will maximize the power saving capability.
  ***Min.saving*:** This mode will minimize the power saving capability.
  ***User define*:** Allow user to define time-out parameters to control power saving. Refer item shown below:

- **Time-out parameters:**

HDD Off After

HDD Off After timer can be set from 1 to 15 minute(s). When system stop reading or writing HDD, the timer starts to count. The system will cut off the HDD power when timer ran out of time. The system will not resume operation until either a read from; or a write to HDD command is executed again.

Doze Mode

The "System Doze" mode timer starts to count when there is no "PM events" occurred. The valid timeout setting is from 1 minute up to 1 hour. The system hardware will drop down CPU clock from normal working speed when Doze mode time-out occurred.

Standby Mode

The "Standby" mode timer starts to count when "System Doze" mode timer timed out and no "PM events" occurred. Valid range is from 1 minute up to 1 hour. When the system standby mode timer ran out, it will enter the standby mode and retain CPU at slow working speed. The screen will be blanked out.

Suspend Mode

This function works only when the Pentium CPU is installed. The timer starts to count when "System Standby" mode timer timed out and no "PM Events" occurred. Valid range is from 1 minute up to 1 hour. When the system suspend timer time out, the system will enter the suspend mode and the chipset will stop CPU clock immediately. The power consumption in Suspend Mode is lower than in standby mode. The screen is also blanked out.

- **Video Off Method**

This field defines the video off features. Three options are available: **V/H SYNC + Blank, DPMS and Blank Only**. The first option, which is the default setting, blanks the screen and turns off vertical and horizontal scanning; “DPMS” (acronym for Display Power management System) allows the BIOS to control the video display card if it supports the DPMS feature; “Blank Only” only blanks the screen. Use the latter for monitors that do not support the “Green” feature.

Take note that a screen saver software does not work with this feature. While the monitor is shut off, this software cannot display.

PM Events:

AWARD BIOS defines 15 PM Events in the power management mode (Doze, standby & suspend). The user can initial any PM Events to be "ON" or "OFF". When the system detects all of the ON events do not have any activity, it will start the system Doze timer first, if the "Power Management" isn't "OFF". Once the system Doze timer timed out, it will process doze power saving procedure by starting the system standby timer. When the standby timer ran out and all of the "ON" events remains silent, the system will enter the standby mode. By now, the system will not only process the standby power saving procedures but also start the system suspend timer. When the suspend timer time out, all of the CPU clock will be stopped by dropping system clock down to zero and remains this way until any one of the "ON" event occurred.

- **IRQ3 to IRQ15**

You can set IRQs 3~15 individually. Activity detected from any enabled IRQ channels will wake up the system.

3-5 PNP/PCI CONFIGURATION SETUP

This "**PNP/PCI configuration**" option configures the PCI bus slots. All PCI bus slots on the system use INTA#, thus all installed PCI cards must be set to this value.

ROM PCI/ISA BIOS (2A5IIJ19)
PNP/PCI CONFIGURATION
AWARD SOFTWARE, INC.

Resources Controlled By : Manual	PCI IRQ Actived By : Level
Reset Configuration Data: Disabled	PCI IDE 2nd Channel : Enabled
	PCI IDE IRQ Map To : PCI-AUTO
IRQ-3 assigned to : Legacy ISA	Primary IDE INT# : A
IRQ-4 assigned to : Legacy ISA	Secondary IDE INT# : B
IRQ-5 assigned to : PCI/ISA PnP	
IRQ-7 assigned to : Legacy ISA	
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 : Legacy ISA	
IRQ-15 assigned to : Legacy ISA	
DMA-0 assigned to : PCI/ISA PnP	Esc: Quit ↑ ↓ →← : Select Item
DMA-1 assigned to : PCI/ISA PnP	F1 : Help Pu/Pd/+/-:Modify
DMA-3 assigned to : PCI/ISA PnP	F5 : Old Values (Shift)F2 : Color
DMA-5 assigned to : PCI/ISA PnP	F6 : Load BIOS Defaults
DMA-6 assigned to : PCI/ISA PnP	F7 : Load Setup Defaults
DMA-7 assigned to : PCI/ISA PnP	

Figure 3-6

IRQxx assigned to

These fields indicate whether or not the displayed IRQ for each field is being used by a Legacy (non-PnP) ISA card. Two options are available: "PCI/ISA PnP" and "Legacy ISA". The first option the default value, indicates either that the displayed IRQ is not used or an PCI/ISA PnP is being used to determine if an ISA card is using that IRQ. Second option is for Legacy ISA card that requires a unique IRQ, and you are not using an PCI/ISA PnP, you must set the field for that IRQ to Legacy ISA.

For example: If you install a Legacy ISA card that requires IRQ10 lets say, then set "IRQ10 assigned to Legacy ISA".

DMAxx assigned to

These fields indicate whether or not the displayed DMA channel for each field is being used by a Legacy (non-PnP) ISA card. Available options include: "PCI/ISA PnP" and "Legacy ISA". When is option "PCI/ISA PnP" indicates either that the displayed DMA channel is not used or an PCI/ISA PnP being used to determine if an ISA card is using that channel. If you install a Legacy ISA card that requires a

unique DMA channel, and you are not using an PCI/ISA PnP, you must set the field for that channel to “Legacy ISA“.

3-6 LOAD BIOS DEFAULTS

The "**LOAD BIOS DEFAULTS**" function loads the system default data directly from ROM and initialize associated hardware properly. This function will be necessary only when the system CMOS data is corrupted.

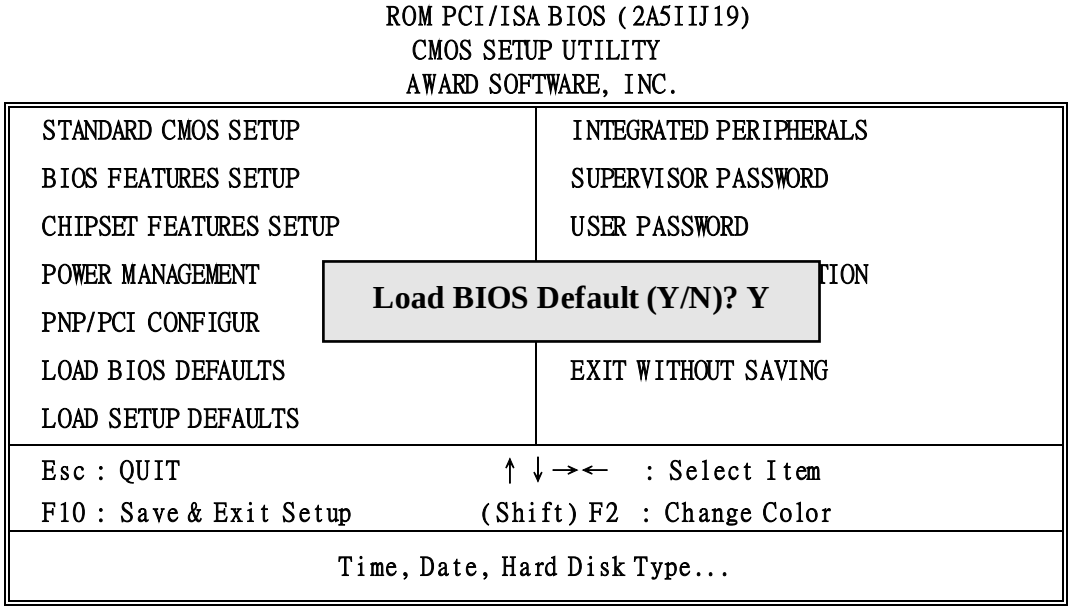
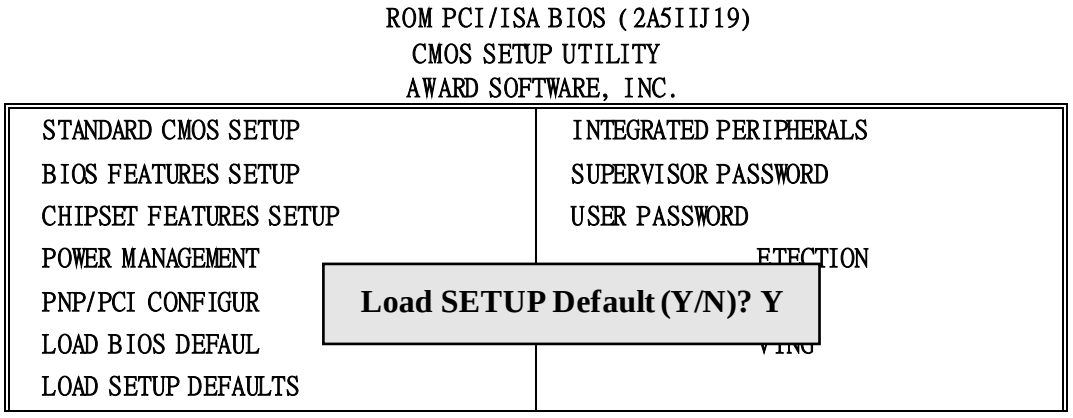


Figure 3-7

3-7 LOAD SETUP DEFAULTS

The "**LOAD SETUP DEFAULTS**" function loads the system default data directly from ROM and initialize associated hardware properly. This function will be necessary only when the system CMOS data is corrupted.



Esc : QUIT	↑ ↓ → ← : Select Item
F10 : Save & Exit Setup	(Shift) F2 : Change Color
Time, Date, Hard Disk Type...	

Figure 3-8

3-8 INTEGRATED PERIPHERALS SETUP

ROM PCI/ISA BIOS (2A5IIJ19)
INTEGRATED PERIPHERALS
AWARD SOFTWARE, INC.

Internal PCI/IDE	: Both	Parallel Port Mode	: Normal
IDE Primary Master PIO	: Auto		
IDE Primary Salve PIO	: Auto		
IDE Secondary Master PIO	: Auto		
IDE Secondary Slave PIO	: Auto	PS/2 mouse function	: Enabled
Primary Master UltraDMA	: Auto	USB Controller	: Enabled
Primary Slave UltraDMA	: Auto	USB Keyboard Support	: Disabled
Secondary Master UltraDMA	: Auto	Power Button Over Ride	: Enabled
Secondary Slave UltraDMA	: Auto	Ring Power Up Control	: Enabled
IDE Burst Mode	: Disabled	Power Up by Alarm	: Enabled
IDE Data Port Post Write	: Enabled	Month Alarm	: NA
IDE HDD Block Mode	: Enabled	Day of Month Alarm	: 0
		Week Alarm	
Onboard FDC Controller	: Enabled	*** SUN MON TUE WED THU FRI SAT ***	
Onboard UART1	: Auto	Off Off Off Off Off Off Off	
Onboard UART2	: Auto	Time (hh:mm:ss) Alarm	: 7: 0: 0
Onboard UART 2 Mode	: Standard		
Onboard Parallel Port	: 378/IRQ7	Esc: Quit ↑ ↓ → ←: Select Item	
		F1 : Help Pu/Pd/+/-: Modify	
		F5 : Old Values (Shift)F2 : Color	
		F6 : Load BIOS Defaults	
		F7 : Load Setup Defaults	

Figure 3-9

NOTE: If you don't use the Onboard IDE connector, than use On-card (PCI or ISA card) IDE connector. You will set Onboard Primary IDE: Disabled an Onboard Secondary IDE: Disabled from CHIPSET FEATURES SETUP UTILITY. The Onboard PCI IDE cable should be equal to or less than 18 inches (45 cm).

- **IDE HDD Block Mode:** The default value is Enabled.
  ***Enabled*:** Enabled IDE HDD Block Mode. The HDD transfer rate is better than Disabled.
  ***Disabled*:** Disable IDE HDD Block Mode.
- **IDE Primary Master PIO:** The default value is Auto.

***Auto*:** BIOS will automatically detect the Onboard Primary Master PCI IDE HDD Accessing mode.
***Mode0~4*:** Manually set the IDE Accessing mode.

- **IDE Primary Slave PIO:** The default value is Auto.
  ***Auto*:** BIOS will automatically detect the Onboard Primary Slave PCI IDE HDD Accessing mode.
  ***Mode0~4*:** Manually set the IDE Accessing mode.
- **IDE Secondary Master PIO:** The default value is Auto.
  ***Auto*:** BIOS will automatically detect the Onboard Secondary Master PCI IDE HDD Accessing mode.
  ***Mode0~4*:** Manually set the IDE Accessing mode.
- **IDE Secondary Slave PIO:** The default value is Auto.
  ***Auto*:** BIOS will automatically detect the Onboard Secondary Slave PCI IDE HDD Accessing mode.
  ***Mode0~4*:** Manually set the IDE Accessing mode.
- **Onboard FDC Controller:** The default value Enabled.
  ***Enabled*:** Enable the Onboard floppy drive interface controller.
  ***Disabled*:** Disable the Onboard floppy drive interface controller. When use On-card ISA FDC's controller.
- **Onboard UART1:** This field allows the user to select the serial port. The default value is Auto.
  ***COM1*:** Enable Onboard Serial port 1 and address is 3F8H.
  ***COM2*:** Enable Onboard Serial port 1 and address is 2F8H.
  ***COM3*:** Enable Onboard Serial port 1 and address is 3E8H.
  ***COM4*:** Enable Onboard Serial port 1 and address is 2E8H.
  ***Disabled*:** Disable Onboard CHIP's Serial port 1.
- **Onboard UART2:** This field allows the user to select the serial port. The default value is Auto.
  ***COM1*:** Enable Onboard Serial port 2 and address is 3F8H.
  ***COM2*:** Enable Onboard Serial port 2 and address is 2F8H.
  ***COM3*:** Enable Onboard Serial port 2 and address is 3E8H.
  ***COM4*:** Enable Onboard Serial port 2 and address is 2E8H.
  ***Disabled*:** Disable Onboard CHIP's Serial port 2.
- **Onboard UART 2 Mode:** The default setting is Standard.
  HPIR: HP standard mode IR.
  ASKIR: ASK standard mode IR.
- **IR function duplex:**

Half: Half duplex IR transfer mode in Half Duplex.
Full: Full duplex IR transfer mode in Full Duplex.

- **RxD, TxD Active:** Select RxD & TxD active signal level.
- **Onboard Parallel port:** This field allows the user to select the LPT port. The default value is 378H.
  ***378H*:** Enable Onboard LPT port and address is 378H.
  ***278H*:** Enable Onboard LPT port and address is 278H.
  ***3BCH*:** Enable Onboard LPT port and address is 3BCH.
  ***Disabled*:** Disable Onboard CHIP's LPT port.

NOTE: Parallel Port address is 378H/3BCH that selects the routing of IRQ7 for LPT1. Parallel Port address is 278H that selects the routing of IRQ5 LPT1.

- **Parallel port Mode:** This field allows the user to select the parallel port mode. The default value is ECP + EPP (Normal).
  ***Normal*:** Standard mode. IBM PC/AT Compatible bidirectional parallel port.
  ***EPP*:** Enhanced Parallel Port mode.
  ***ECP*:** Extended Capabilities Port mode.
  ***EPP+ECP*:** ECP Mode & EPP Mode.
- **PS/2 mouse function (Enabled):** Setting the function of PS/2 mouse. When you choice: Disabled, BIOS will release IRQ12 for other device use the default value is Enabled.
- **USB Controller (Enabled):** Setting the function of USB controller. Default value is Enabled.
- **USB Keyboard Support (Disabled):** Setting the USB keyboard support function default value is Disabled. When you want use USB keyboard you must Enabled it.
- **Power Button Over Ride (Enabled):** Setting the Power Button function when setting Enabled and press the power button continuos more than 4 sec, will make the power off.
- **Ring Power Up Control (Enabled):** When setting this item Enabled, and press the power button to power off. After Ring in the System will auto power on.
- **Power Up by Alarm (Disabled):** Default value is Disabled, when choice Enabled you can setting Month Alarm, Day of Month Alarm, Week Alarm, Time Alarm to setup the time and date to power on the computer.
- **Power Button Over Ride (Enabled):** Setting the Power Button function . In normal operation set this item Enabled, and press Power Button continuos at least 4 sec will make computer power off. When Enabled Power Manage and

Enabled this item, push the Power Button. The system will go to suspend mode, if press the button continuos more than 4 sec, the computer will power off.

3-9 SUPERVISOR/USER PASSWORD

This 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 (Refer to Figure 3-3 for the details). 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 either Supervisor Password or User Password in the Main Menu and press <Enter>. The following message appears:
   "**Enter Password:**"
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:
   "**Confirm Password:**"
4. Enter exact the same password you just typed again 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 bad 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.

3-10 IDE HDD AUTO DETECTION

The "IDE HDD AUTO DETECTION" utility is a very useful tool especially when you do not know which kind of hard disk type you are using. You can use this utility to detect the correct disk type and install in the system automatically. Also you can set HARD DISK TYPE to “Auto” in the STANDARD CMOS SETUP to have same result. The BIOS will Auto-detect the hard disk size and model on display during POST.

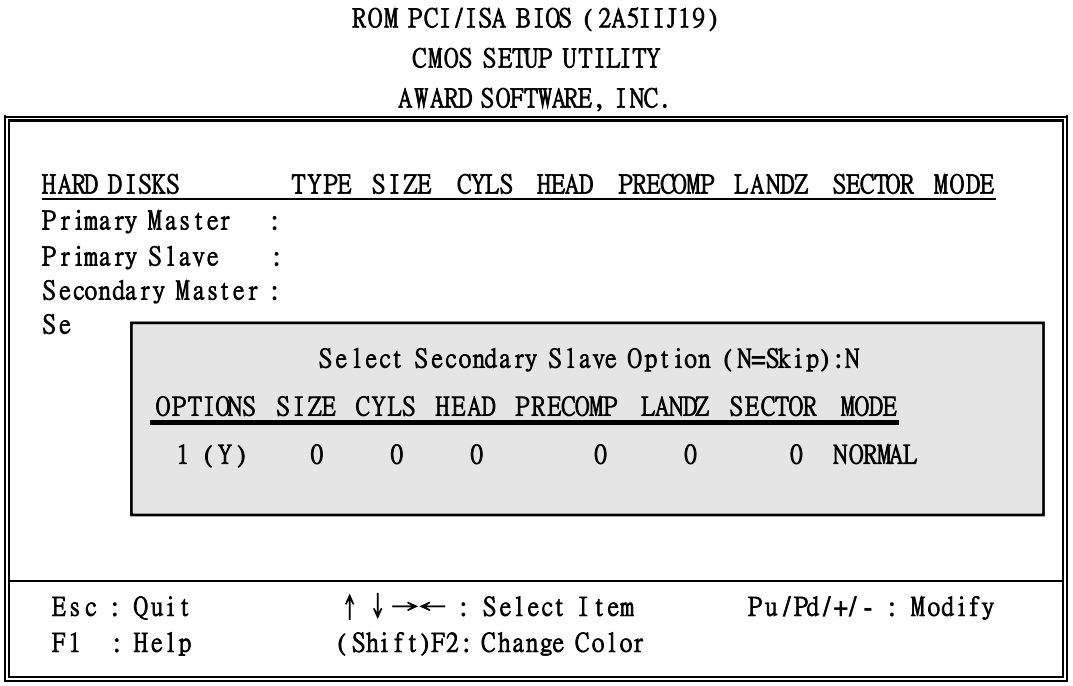


Figure 3-10

NOTE: HDD Modes
The Award BIOS supports 3 HDD modes : NORMAL, LBA & LARGE

NORMAL mode

Generic access mode in which neither the BIOS nor the IDE controller will make any transformations during accessing.

The maximum number of cylinders, head & sectors for NORMAL mode are 1024, 16 & 63.

	no.	Cylinder	(1024)
x	no.	Head	(16)
x	no.	Sector	(63)
x	no.	per sector	(512)

528 Megabytes

If user set this HDD to NORMAL mode, the maximum accessible HDD size will be 528 Megabytes even though its physical size may be greater than that!

LBA (Logical Block Addressing) mode

A new HDD accessing method to overcome the 528 Megabyte bottleneck. The number of cylinders, heads & sectors shown in setup may not be the number physically contained in the HDD.

During HDD accessing, the IDE controller will transform the logical address described by sector, head & cylinder into its own physical address inside the HDD.

The maximum HDD size supported by LBA mode is 8.4 Gigabytes which is obtained by the following formula:

	no. Cylinder	(1024)
x	no. Head	(255)
x	no. Sector	(63)
x	bytes per sector	(512)
		8.4 Gigabytes

LARGE mode

Extended HDD access mode supported by Award Software.

Some IDE HDDs contain more than 1024 cylinder without LBA support (in some cases, user do not want LBA). The Award BIOS provides another alternative to support these kinds of LARGE mode:

CYLS.	HEAD	SECTOR	MODE
1120	16	59	NORMAL
560	32	59	LARGE

BIOS tricks DOS (or other OS) that the number of cylinders is less than 1024 by dividing it by 2. At the same time, the number of heads is multiply by 2. Reverse transformation process will be made inside INT 12h in order to access the right HDD address the right HDD address!

Maximum HDD size:

	no. Cylinder	(1024)
x	no. Head	(32)
x	no. Sector	(63)
x	bytes per sector	(512)
		1 Gigabytes

NOTE: To support LBA or LARGE mode of HDDs, there must be some softwares involved. All these softwares are located in the Award HDD Service Routine (1NT 13h). It may be failed to access a HDD with LBA (LARGE) mode selected if you are running under a Operating System which replaces the whole INT 13h.

UNIX operating systems do not support either LBA or LARGE and must utility the Standard mode. UNIX can support drives larger than 528MB.

3-11 SAVE & EXIT SETUP

The "SAVE & EXIT SETUP" option will bring you back to boot up procedure with all the changes you just made which are recorded in the CMOS RAM.

3-12 EXIT WITHOUT SAVING

The "EXIT WITHOUT SAVING" option will bring you back to normal boot up procedure without saving any data into CMOS RAM. All of the old data in the CMOS will not be destroyed.

3-13 I/O & MEMORY MAP

MEMORY MAP

Address Range	Size	Description
00000-7FFFF	512K	Conventional memory
80000-9FBFF	127K	Extended Conventional memory
9FC00-9FFFF	1K	Extended BIOS data area if PS/2 mouse is installed
A0000-C7FFF	160K	Available for Hi DOS memory
C8000-DFFFF	96K	Available for Hi DOS memory and adapter ROMs
E0000-EEFFF	60K	Available for UMB
EF000-EFFFF	4K	Video service routine for Monochrome & CGA adapter
F0000-F7FFF	32K	BIOS CMOS setup utility
F8000-FCFFF	20K	BIOS runtime service routine (2)
FD000-FDFFF	4K	Plug and Play ESCD data area

FE000-FFFFF	8K	BIOS runtime service routine (1)

I/O MAP

000-01F	DMA controller (Master)
020-021	INTERRUPT CONTROLLER (Master)
022-023	CHIPSET control registers. I/O ports
040-05F	TIMER control registers
060-06F	KEYBOARD interface controller (8042)
070-07F	RTC ports & CMOS I/O ports
080-09F	DMA register
0A0-0BF	INTERRUPT controller (Slave)
0C0-0DF	DMA controller (Slave)
0F0-0FF	MATH COPROCESSOR
1F0-1F8	HARD DISK controller
278-27F	PARALLEL port 2
2B0-2DF	GRAPHICS adapter controller
2F8-2FF	SERIAL port 2
360-36F	NETWORK ports
378-37F	PARALLEL port 1
3B0-3BF	MONOCHROME & PARALLEL port adapter
3C0-3CF	EGA adapter
3D0-CDF	CGA adapter
3F0-3F7	FLOPPY DISK controller
3F8-3FF	SERIAL port-1

3-14 TIME & DMA CHANNELS MAP

TIME MAP:

TIMER Channel 0 System timer interrupt
TIMER Channel 1 DRAM REFRESH request
TIMER Channel 2 SPEAKER tone generator

DMA CHANNELS:

DMA Channel 0 Available
DMA Channel 1 Onboard ECP (Option)
DMA Channel 2 FLOPPY DISK (SMC CHIP)
DMA Channel 3 Onboard ECP (default)
DMA Channel 4 Cascade for DMA controller 1
DMA Channel 5 Available
DMA Channel 6 Available
DMA Channel 7 Available

3-15 INTERRUPT MAP

NMI:

Parity check error

IRQ (H/W):

0 System TIMER interrupt from TIMER 0
1 KEYBOARD output buffer full
2 Cascade for IRQ 8-15
3 SERIAL port 2
4 SERIAL port 1
5 PARALLEL port 2
6 FLOPPY DISK (SMC CHIP)
7 PARALLEL port 1
8 RTC clock
9 Available
10 Available
11 Available
12 PS/2 Mouse
13 MATH coprocessor
14 Onboard HARD DISK (IDE1) channel
15 Onboard HARD DISK (IDE2) channel

3-16 BIOS REFERENCE-POST CODES

ISA PORT codes are typically output to port address 80h.

Post	Name	Description
CO	Turn Off Chipset Cache	OEM Specific-Cache controller.
1	Processor Test 1	Processor Status (1 FLAGS) Verification. Tests the following processor status flags carry, zero, sign, overflow. The BIOS will set each of these flags, verify the are set, then turn each flag off and verify it is off.
2	Processor Test 2	Read/ Write/ Verify all CPU registers except SS, SP, and BP with data pattern FF and OO.
3	Initialize Chips	Disable NMI, PIE, AIE, UEI, SOWV. Disable video, parity checking, DMA. Reset math coprocessor. Clear all page registers, CMOS shutdown byte. Initialize timer 0, 1, and 2, including set EISA timer to a known state. Initialize DMA Controllers 0 and 1. Initialize interrupt controllers 0 and 1. Initialize EISA extended registers.
4	Test Memory Refresh Toggle	RAM must be periodically refreshed inorder to keep the memory from decaying. This function assures that the memory refresh function is working properly.
5	Blank video, Initialize keyboard	Keyboard controller initialization.
6	Reserved	
7	Test CMOS Interface and Battery Status	Verifies CMOS is working correctly, detects bad battery.
BE	Chipset Default Initialization	Program chipset registers with power on BIOS defaults.
C1	Memory presence test	OEM Specific-Test to size on-board memory.

C5	Early Shadow	OEM Specific-Early Shadow enable for fast boot.
C6	Cache presence test	External cache size detection.

8	Setup low memory	Early chip set initialization. Memory presence test. OEM chip set routines. Clear low 64K of memory. Test first 64K memory.
9	Early Cache Initialization	Cyrix CPU initialization. Cache initialization.
A	Setup Interrupt Vector Table	Initialization first 120 interrupt vectors with SPURIOUS_INT_HDLR and initialize INT 00h-1Fh according to INT_TBL
B	Test CMOS RAM Checksum	Test CMOS RAM Checksum, if bad, or insert key pressed, load defaults.
C	Initialize keyboard	Detect type of keyboard controller (optional) Set NUM_LOCK status.
D	Initialize Video Interface	Detect CPU clock. Read CMOS location 14h to find out type of video in use. Detect and Initialize Video Adapter.
E	Test Video Memory	Test video memory, write sign-on message to screen. Setup shadow RAM.Enable shadow according to Setup.
F	Test DMA Controller 0	BIOS checksum test. Keyboard detect and initialization.
10	Test DMA Controller 1	
11	Test DMA Page Registers	Test DMA Page Registers.
12-13	Reserved	
14	Test Timer Counter 2	Test 8254 Timer 0 Counter 2.
15	Test 8259-1 Mask Bits	Verify 8259 Channel 1 masked interrupts by alternately turning off and on the interrupt lines.
16	Test 8259-2 Mask Bits	Verify 8259 Channel 2 masked interrupts by alternately turning off and on the interrupt lines.

17	Test Stuck 8259's Interrupt Bits	Turn off interrupts then verify no interrupt mask register is on.
18	Test 8259 Interrupt Functionality	Force an interrupt and verify the interrupt occurred.
19	Test Stuck NMI Bits (Parity I/O Check)	Verity NMI can be cleared.
1A		Display CPU clock.
1B-1E	Reserved	
1F	Set EISA Mode	If EISA non-volatile memory checksum is good, execute EISA initialization. If not, execute ISA tests an clear EISA mode flag. Test EISA Configuration Memory Integrity (checksum & communication interface).
20	Enable Slot 0	Initialization slot 0 (System Board).
21-2F	Enable Slot 1-15	Initialize slot 1 through 15.
30	Size Base and Extended Memory	Size base memory from 256K to 640K and extended memory above 1MB.
31	Test Base and Extended Memory	Test base memory from 256K to 640K and extended memory above 1MB using various patterns. NOTE: This will be skipped in EISA mode and can be "skipped" with ESC key in ISA mode.
32	Test EISA Extended Memory	If EISA Mode flag is set then test EISA memory found in slots initialization. NOTE: This will be skipped in ISA mode and can be "skipped" with ESC key in EISA mode.
33-3B	Reserved	
3C	Setup Enabled	
3D	Initialize & install Mouse	Detect if mouse is present, initialize mouse, install interrupt vectors.
3E	Setup Cache Controller	Initialize cache controller.
3F	Reserved	
BF	Chipset Initialization	Program chipset registers with Setup values
40		Display virus protest disable or enable.
41	Initialize Floppy Drive & Controller	Initialize floppy disk drive controller and drives.
42	Initialize Hard Drive & controller	Initialize hard drive controller and any drives.

43	Detect & Initialize Serial/Parallel Ports	Initialize any serial and parallel ports (also game port).
44	Reserved	
45	Detect & Initialize Math Coprocessor	Initialize math coprocessor.
46	Reserved	
47	Reserved	
48-4D	Reserved	
4E	Manufacturing POST Loop or Display Messages	Reboot if Manufacturing POST Loop pin is set. Otherwise display any messages (i.e., any non-fatal errors that were detected during POST) and enter Setup.
4F	Security Check	Ask password security (optional).
50	Write CMOS	Write all CMOS values back to RAM and clear screen.
51	Pre-boot Enable	Enable parity checker. Enable NMI, Enable cache before boot.
52	Initialize Option ROMs	Initialize any option ROMs present from C8OOOh to EFFFFh. NOTE: When FSCAN option is enabled, will initialize from C8OOOh to F7FFFh.
53	Initialize Time Value	Initialize time value in 40h:BIOS area.
60	Setup Virus Protect	Setup virus protect according to Setup.
61	Set Boot Speed	Set system speed for boot.
62	Setup Num Lock	Setup Num Lock status according to Setup.
63	Boot Attempt	Set low stack. Boot via INT 19h.
B0	Spurious	If interrupt occurs in protected mode.
B1	Unclaimed NMI	If unmasked NMI occurs, display. Press F1 to disable NMI, F2 reboot.
E1-EF	Setup Pages	E1-Page 1, E2-Page 2, etc.
FF	Boot	

Chapter 4

Software Installed

WINDOWS 3.1X Display Driver Quick Installation

Step 1. Run windows, Change your directory path to D:\5598\VGA\WIN31, Running "setup.exe"

According the process to complete installation

Step 2. From "SIS Multimedia V1.04" window, you can setup the resolution, Font size and monitor type

WINDOWS 95 Display Driver Quick Installation

Step 1. Boot form Windows 95, Double-click "My computer" icon, "Control panel" icon, "Display" icon

Step 2. When the "Display properties" window appear, choose "setting" tab, select "Change Display type" (if you are windows 95 OSR2 user select "Advanced properties")

Step 3. Select "Adapter type" section, Select "Change"

Step 4. When the "Select Device" window appear, select "Have Disk", Change the directory path from "A:\" to "D:\5598\VGA\Win95", select "OK". (if your CD-ROM is D driver)

Step 5. When the "Select Device" window appear again, select "OK".

Step 6. When the "Change Display type" window appear again, select "CLOSE"

Step 7. When the "Display properties" window appear again, select "CLOSE"

Step 8. Restart Windows 95

Step 9. If you repeat step 1 and step 2, you can setup the resolution, Font size and monitor type , You will be finished your installation

WINDOWS NT4.0 Display Driver Quick Installation

Step 1. Boot form Windows NT4.0, Double-click "My computer" icon, "Control panel" icon, "Display" icon

Step 2. When the "Display properties" window appear, choose "setting" tab, select "Display type"

Step 3. When the "Display type" window appear, Select "Change"

Step 4. When the "Change Display" window appear, select "Have Disk", Change the directory path from "A:\" to "D:\5598\VGA\WINNT40", select "OK". (if your CD-ROM is D driver)

Step 5. When the "Display type" window appear again, select "CLOSE".

Step 6. When the "Display properties" window appear again, select "CLOSE"

Step 7. Restart Windows NT40

Step 8. When the "Display properties" window appear, setup your resolution, select "test", select "OK", you will be finished your installation

WINDOWS NT3.5X Display Driver Quick Installation

Step 1. Boot form Windows NT3.5X, Copy "D:\5598\VGA\WINNT35*.*" to "A:\" (if your CD-ROM is D driver)
Double-click "Main" icon, select "Control panel" icon, select "Display" icon

Step 2. When the "Display setting" window appear, select "Change display type"

Step 3. When the "Display type" window appear, select "Change"

Step 4. When the "Select device" window appear, select "OTHER". Push your Disk into Driver A select "install"

Step 5. When the "Install device" window appear, select "YES"

Step 6. When the "Windows NT setup" window appear, select "CONTINUS"

Step 7. Restart Windows NT3.5X, you will be finished your installation

SOFTWARE MPEG XING 1.4

(Only use for Windows 3.1x)

step 1. Run Windows 3.1X, Change your directory path to D:\xing\xing140\DM (if your CD-ROM is D driver)

step 2. Run "setup" according the process to complete installation, select "XINGMPEG PLAYER " icon, play MPEG file or Video CD

SOFTWARE MPEG XING 3.02

(Only use for Windows 95)

step 1. Run Windows 95, Change your directory path to D:\xing\xing302
(if your CD-ROM is D driver)

step 2. Run "setup" according the process to complete installation, select talk bar "Start", "Program", "XingMpeg play", play MPEG file or Video CD

Chapter 5

Question and Answer

Question 1: When use External VGA CARD and using DIMM in SDRAM2 (BANK2) only the system don't have the screen.

Ans: Change the DIMM to SDRAM1 to solve this problem.

Question 2: When using Ti 32MB DIMM 2pcs, no screen on system.

Ans: Please change the "SDRAM CAS Latency" setting in BIOS CHIPSET FEATURES SETUP the default value is "3T", Please change to "2T", Please follow the step to change the setting

step 1. Only plug one pcs DIMM let the system boot up.
step 2. Press <DEL> enter CMOS SETUP UTILITY to set up.
step 3. Choice "CHIPSET FEATURES SETUP"
step 4. Setting "SDRAM CAS LATENCY" value to "2T"
step 5. SAVE CMOS and EXIT
step 6. Power Off and Plug another DIMM, Power On again.

Question 3: When Install OS/2 REV:3 will SCSI Hard Disk and IDE CDROM plug in Slave Mode, the system will hang up.

Ans: Please change the IDE CDROM DRIVER to Master Mode to solve this Problem.

Question 4: After Install Win 95 have "?" mark in PCI Universal Serial Bus Device item when you check Device Manager icon in control panel.

Ans: You can solve the problem "Microsoft Supplemental 3 for Windows 95" Utility, because Microsoft build in SIS USB Device Driver after Supplemental 3 utility. Before this version Windows 95 can not recognize USB Device in SIS 5598 chip set.