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Manual Version R3.3

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VL-MAINBOARD HOT-419DZ (REV 3)

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Preface

Congratulation on purchasing this 419 mainboard. 419 mainboard is a highly integrated IBM PC/AT compatible system board designed to accommodate 25MHz to 100MHz 486 processors, and features a high-performance secondary cache memory architecture from 64KB up 512KB. This mainboard also features eight ISA bus expansion slots combined with three VL-bus expansion slots and the most flexible green function.

The combination of flexible CPU supports, a large secondary cache memory size, advanced VL-bus architecture, and the green function make this mainboard ideal for building powerful systems that must met the demanding requirements of today's graphical user interfaces and advanced operating systems.

Chapter 1 Introduction

Specification

CPU Function

- CPU clock: 25/33/40/50/66/80/100/120/133 MHz
- Supporting Intel 486SX/DX/DX2/DX4,
  AMD Am486 Enhanced, 486DX/DX2/DX4,
  Am5x86-P75
  Cyrix Cx486S/DX/DX2, Cx5x86,
- Supporting S-Series CPU

Chipset

- OPTi 82C895 and 82C602
- Supporting L1 write back cache
- Supporting main, video and adapter shadow programmable
- Shadow RAM cacheable function programmable

Memory

- Supporting four banks of local DRAM system ranging from 1MB to 128MB of host memory
- Supporting 256K x 36/32 (1MB), 512K x 36/32 (2MB), 1M x 36/32 (4MB), 2M x 36/32 (8MB), 4M x 36/32 (16MB), 8M x 36/32 (32MB), and 16M x 36/32 (64MB) 72-pins SIMM

Cache Memory

- Supporting 64K, 128KB, 256KB, and 512KB secondary cache.

Power Management Function

- Provides two power management modes : Auto and SMI
- **Auto_mode** used to accommodate **non S-series CPU**
- **SMI_mode** used to accommodate **S-series CPU**
- Supporting monitor sleep mode control
- Supporting individual IDE hard disk drive power down control
- Supporting EPMI (External Power Management Interface) port for monitor power on/off control
- Supporting MicroSoft APM (Advanced Power Management) function

Expansions

- 32-bit VL-bus slot x 3 (Support one or two bus mastering, depending on memory configuration mode)
- 16-bit ISA slot x 6
- 8-bit ISA slot x 2

BIOS

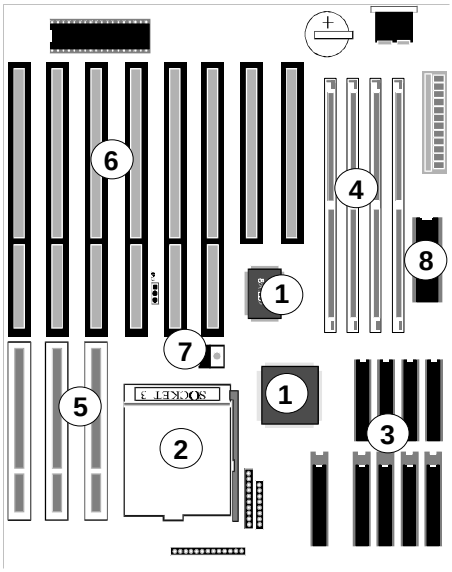
- Licensed advanced AMI WinBIOS

Board Design

- Dimension : 22cm x 26cm

419 Mainboard Description

The major components of 419 maniboard are illustrated and described right and below. Please take a minute to become familiar with the board design.



1. Chipset ASIC

419 mainboard is designed around a set of highly integrated OPTi ASIC, which offers optimum performance on VL and ISA base system for a cache controller, a local DRAM controller, and power management control.

2. Microprocessor

419 mainboard accept member of the 486 family of high performance 32-bit microprocessors in PGA package. The mainboard is designed to run at a clock speed from 25 to 50MHz on CPU bus clock, and 25 to 133MHz on CPU core clock.

3. Secondary Cache Architecture

419 maniboard features a secondary cache memory architecture, which complements the 8KB or 16KB internal cache of the 486 family. It support secondary cache with the size of 64KB, 128KB, 256KB, and 512KB.

4. Memory Architecture

419 mainboard features four 72-pin SIMM (Single In-line Memory Module) sockets organized into four banks, which allow flexible memory configuration and expansion. It may use 1MB, 2MB, 4MB, 8MB, 16MB, 32MB, and 64MB SIMM to expand memory from 1MB to 128MB.

5. VL-bus Expansion Slots

419 mainboard provides three 32-bit VL-bus expansion slots, which may accommodate many third-party expansion cards and increase flexibility in designing custom platforms.

6. ISA bus Expansion Slots

419 mainboard provides six16-bit and two 8-bit ISA expansion slots, which may accommodate many third-party expansion cards and enormous flexibility in designing custom platforms.

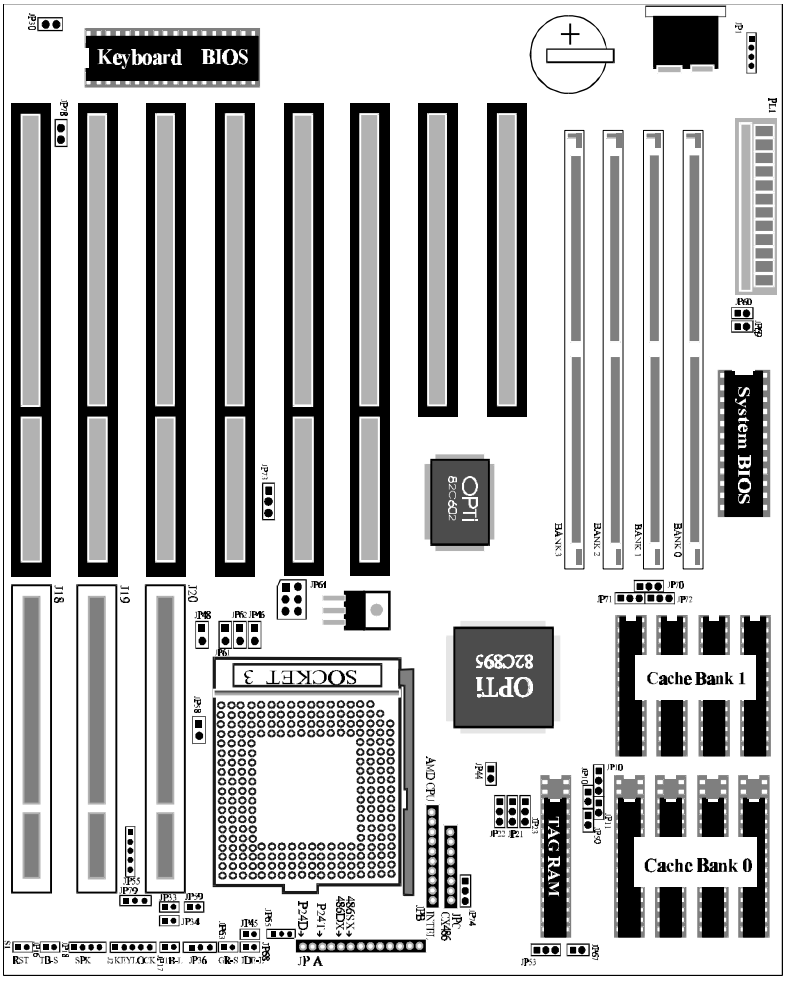
7. 5V- 3.3/3.45/4.0V Voltage Regulator

For Intel 486DX4 (P24C), AMD Am486DX2-80/DX4-100/Am5x86-P75, and Cyrix 486DX2-66/80/100/Cx5x86 CPU, 419 mainboard provides a voltage regulator to regulate voltage from 5V to 3.3/ 3.45/4.0V.

8. System BIOS

419 mainboard provides a licensed AMI system WinBIOS which is particularly designed to offer optimum performance of the mainboard.

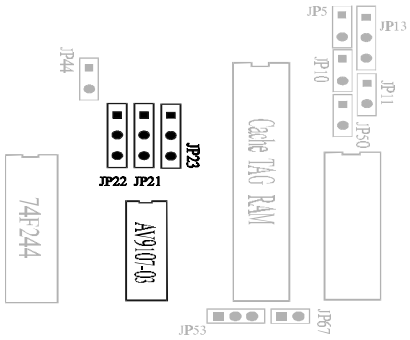
419 Mainboard Placement



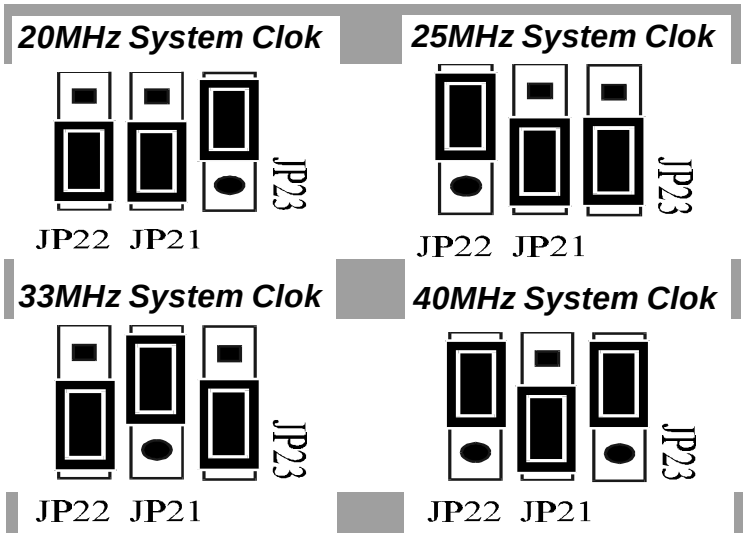
Chapter 2 Jumper Setting

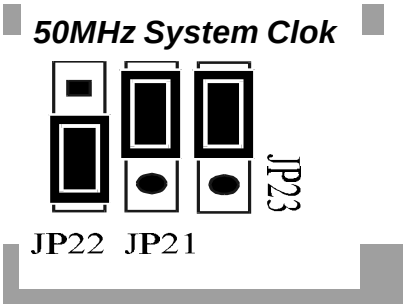
System Clock Selection

419 mainboard features a clock generator to provide adjustable system clock frequency. JP21, JP22, and JP23 are all 3-pin jumper which determine the clock frequency from 20MHz to 50MHz.

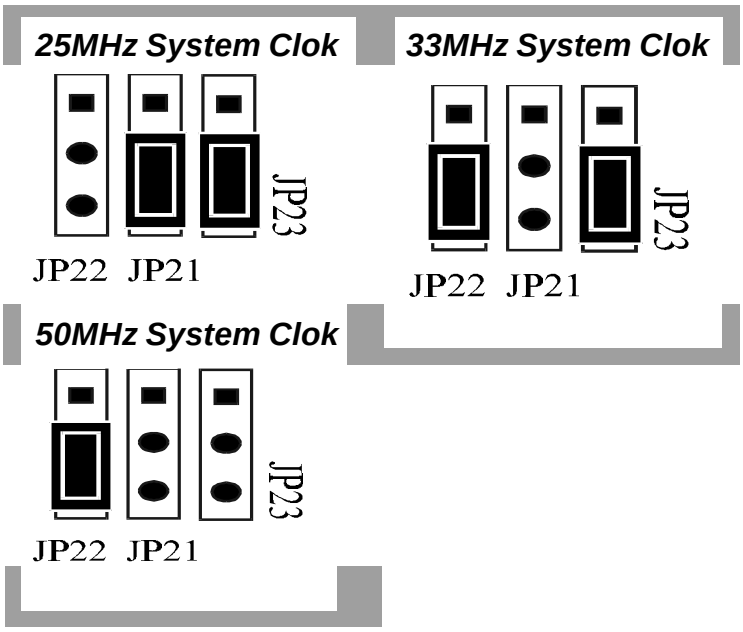


System Clock Setup For 486 except Intel 486DX4 & P24T





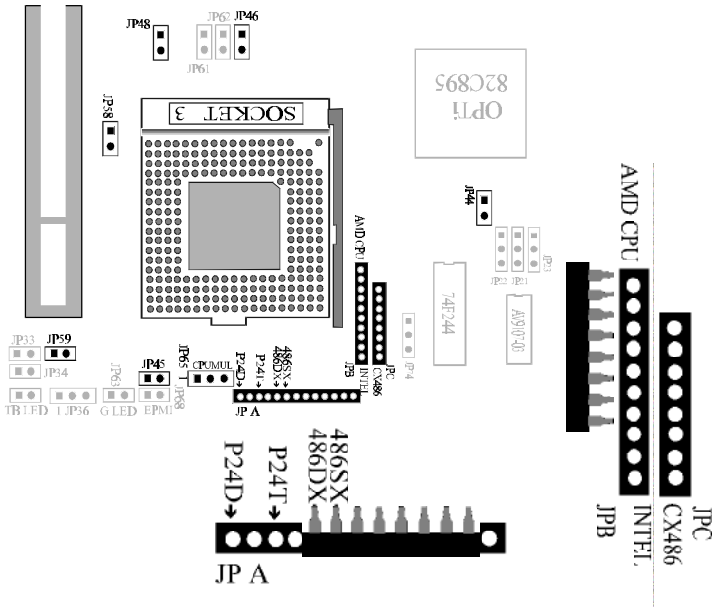
System Clock Setup For Intel 486DX4 & P24T



CPU Type Selection

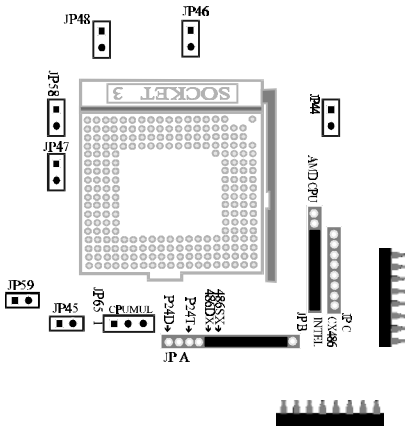
419 mainboard accepts any member of the 486 series microprocessors. If you try to install or upgrade the CPU, you must set the CPU type jumpers accordingly.

The CPU type is set through a combination of the the jumper and resistor pack. Please follows the procedure very carefully, or contact the local service company. Otherwise the system may not function properly.

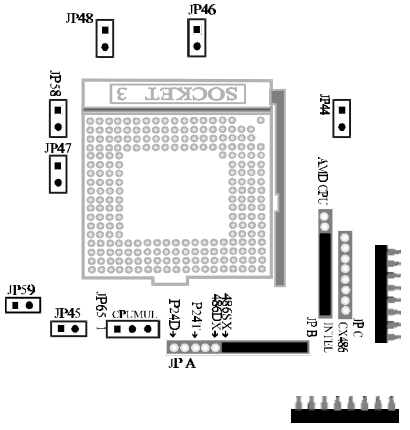


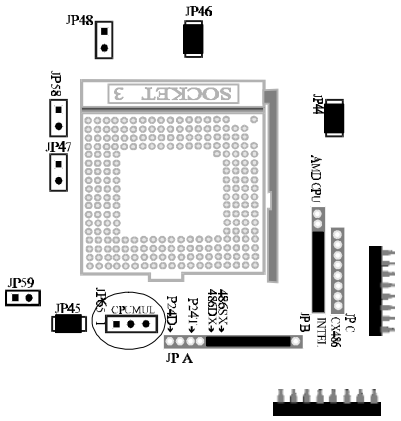
Note : It is highly recommended that a CPU cooling fan is attached to the CPU to ensure system stability.

Intel 486DX/DX2



Intel 486SX, UMC U5-S





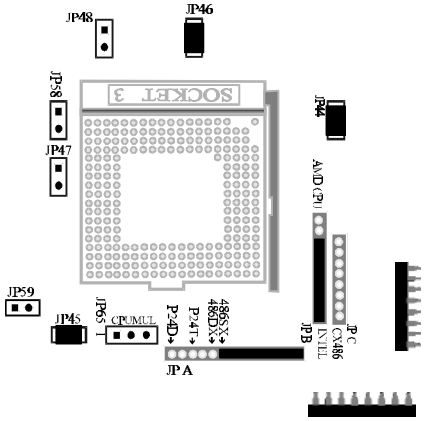
Intel 486DX4 Clock Multiplier - JP65

For Intel 486DX4 (P24C) CPU, 419 mainboard offers jumper JP65 to adjust CPU core clock frequency to 2 or 3 times of external bus clock frequency.

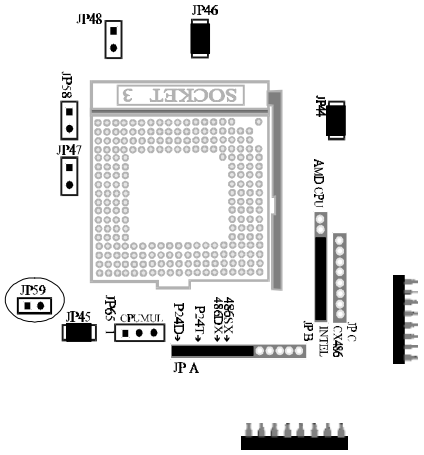
Intel 486DX4 Clock Multiplier

CPU Type	Core/Bus Clock Ratio	JP65	Internal Core Clock	External Bus Clock
DX4-100	3 : 1		100MHz	33MHz
DX4-100	2 : 1		100MHz	50MHz
DX4-75	3 : 1		75MHz	25MHz

Intel 486SX-S Series

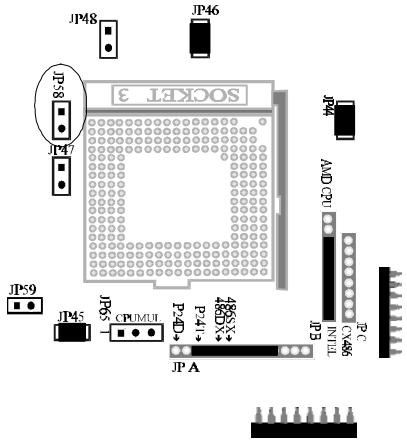


Intel P24D (486DX2 Write-Back Cache)



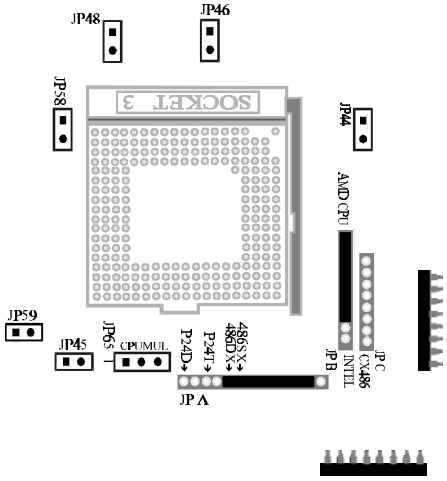
Intel P24D CPU Cache Line	
Cache Scheme	JP59
Write-Back	
Write-Through	
Other CPU	

Intel P24T



Intel P24T CPU Cache Line	
Cache Scheme	JP58
Write-Back	
Write-Through	
Other CPU	

AMD Am486DX/DX2/DX4 (NV8T)



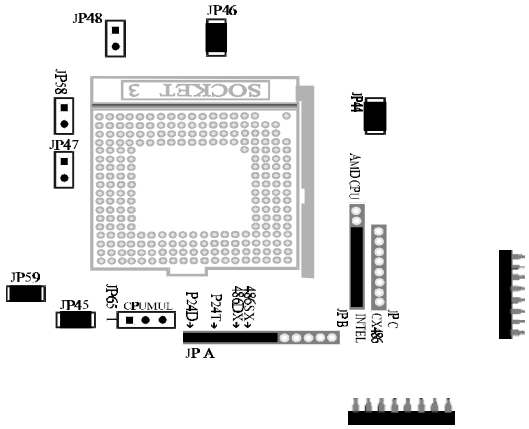
AMD 486DX2/DX4 Clock Multiplier - JP65

For AMD Am486DX2-80 and Am486DX4-100 CPU, 419 mainboard also offers jumper JP65 to adjust CPU core clock frequency to 2 or 3 times of external bus clock frequency.

AMD 486DX2/DX4 Clock Multiplier

CPU Type	Core/Bus Clock Ratio	JP65	Internal Core Clock	External Bus Clock
DX4-120	3 : 1		120MHz	40MHz
DX4-100	3 : 1		100MHz	33MHz
DX4-100	2 : 1		100MHz	50MHz
DX2-80	3 : 1		75MHz	25MHz
DX2-80	2 : 1		80MHz	40MHz

AMD Am486 Enhanced (SV8B), Am5x86-P75, Cyrix Cx5x86

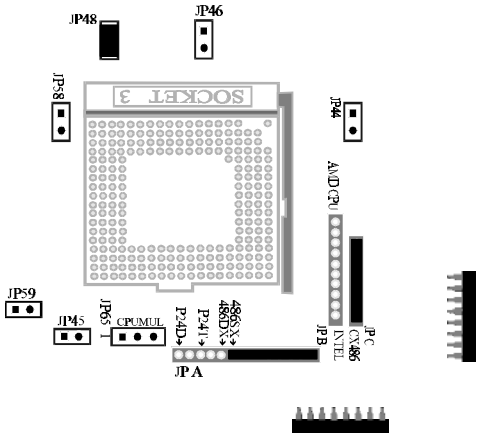


AMD Am486 Enhanced, Am5x86-P75, Cyrix Cx5x86 Clock Multiplier - JP65

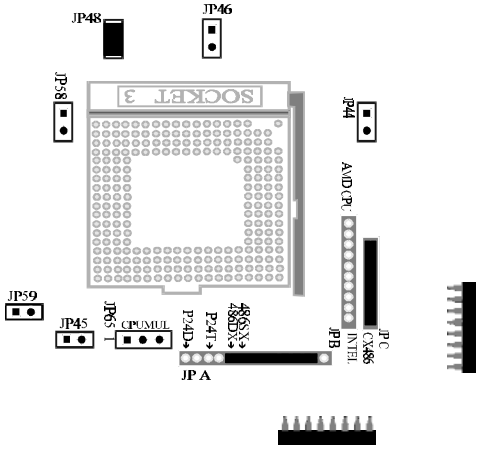
For AMD Am486 Enhanced, Am5x86-P75, and Cyrix Cx5x86 CPU, 419 mainboard offers jumper JP65 to adjust CPU core clock frequency from 2 to 3 or 4 of external bus clock frequency.

CPU Type	Core/Bus Clock Ratio	JP65	Internal Core Clock	External Bus Clock
AMD Am486DX Enhance -100	3 : 1		100MHz	33MHz
AMD Am486DX Enhance -120	3 : 1		120MHz	40MHz
AMD Am5x86-P75	4 : 1		133MHz	33MHz
Cyrix Cx5x86-100	3 : 1		100MHz	33MHz
Cyrix Cx5x86-120	3 : 1		120MHz	40MHz
Cyrix Cx5x86-133	4 : 1		133MHz	33MHz

Cyrix Cx486S (M6)

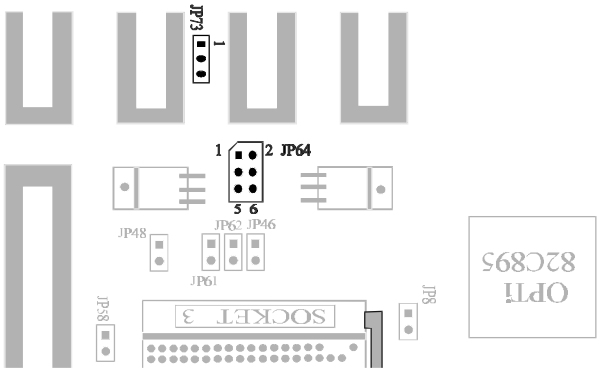


Cyrix Cx486DX/DX2/DX4 (M7)



CPU Voltage Selection

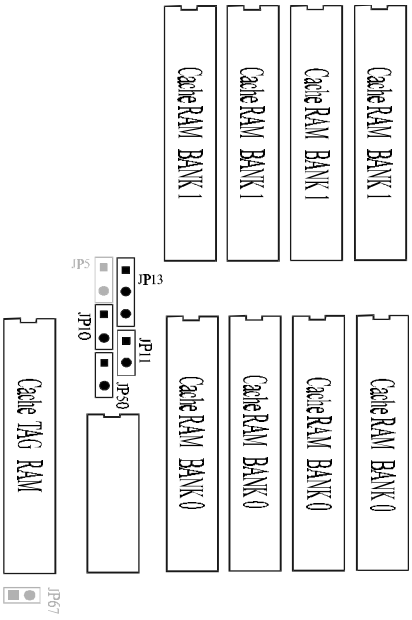
For Intel 486DX4, AMD Am486DX2-80/DX4-100, and Cyrix Cx486DX2-66/DX2-80 CPU, 419 mainboard features single voltage regulator to generate the voltage for CPU (Vcc) from 5V to 3.3/3.45/4.0V. JP64 and JP73 are provided for voltage setting between 5V and 3.3/3.45/4.0V.

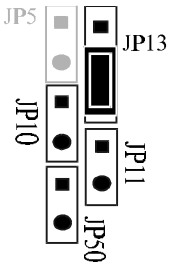


CPU Voltage Selection			
CPU Voltage	**JP64**	**JP73**	**Remark**
5V	1 2 / 5 6	Don't Care	For 5V CPU
3.3 V	1 2 / 5 6	'1 - 2	For Intel 3V 486DX4, Cyrix 3.3V Cx486DX2 CPU
3.45 V		Open	For AMD 3V 486DX2/DX4 CPU
4.0 V		'2 - 3	For Cyrix 4V Cx486DX2 CPU

Cache Size Selection

419 mainboard supports secondary cache memory sizes of 64KB,128KB, 256KB, and 512KB. Cache memory is realized by eight Data SRAM and one Tag SRAM. Cache memory is organized into two banks, with four SRAM assigned to each bank. The Data SRAM used in 419 mainboard is 8Kx8, 32Kx8, 64Kx8, and 128Kx8, Tag SRAM type can be 8Kx8, and 32Kx8. *(64Kx8 Data SRAM available only on some 419 version)*

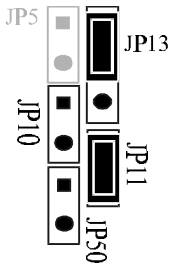




64 KB Cache Memory

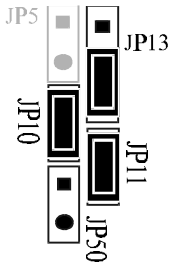
Cache Size	Bank 0 Data RAM U5, U6, U7, U8	Bank 1 Data RAM U9, U10, U11, U12	Tag RAM U13
64KB	8K x 8	8K x 8	8K x 8

128 KB Cache Memory



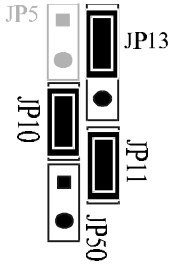
Cache Size	Bank 0 Data RAM U5, U6, U7, U8	Bank 1 Data RAM U9, U10, U11, U12	Tag RAM U13
128KB	32K x 8	Empty	32K x 8

256 KB Cache Memory (Double Bank)

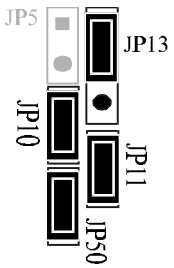


Cache Size	Bank 0 Data RAM U5, U6, U7, U8	Bank 1 Data RAM U9, U10, U11, U12	Tag RAM U13
256KB	32K x 8	32K x 8	32K x 8

256 KB Cache Memory (Single Bank)



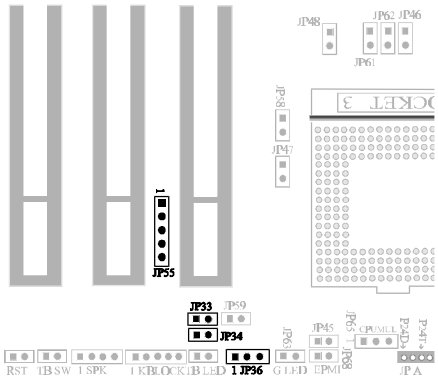
Cache Size	Bank 0 Data RAM U5, U6, U7, U8	Bank 1 Data RAM U9, U10, U11, U12	Tag RAM U13
256KB	64K x 8	Empty	32K x 8



512 KB Cache Memory

Cache Size	Bank 0 Data RAM U5, U6, U7, U8	Bank 1 Data RAM U9, U10, U11, U12	Tag RAM U13
512KB	128K x 8	Empty	32K x 8

VESA Local Bus Configuration



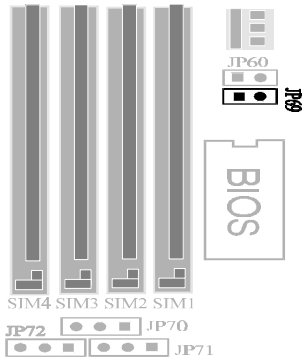
419 mainboard provides JP34 for regulating VESA Local bus card speed to match CPU speed, and JP33 for selecting VL-bus card's high speed write wait state.

Note: If a similar function is supplied on user's VL-bus card, this section can be ignore. (Also refer to the next section of CPU RDY# delay)

VESA Local Bus Config	JP33	JP34
VL-Bus Speed > 33MHz	X	
VL-Bus Speed < 33MHz	X	
High Speed Write 0 W/S		X
High Speed Write 1 W/S		X

CPU RDY# Signal Delay Configuration

419 mainboard provides JP55 and JP69 to configure CPU RDY# signal delay. there are two compositions - Setup 1 and Setup 2. By selecting one of those two setups, the user may find a proper way to make VL-bus devices work well under any clock speed.



CPU RDY# Delay	JP55	JP69	Recommended
Setup 1			33MHz or 50MHz system clock with fast VL-bus devices
Setup 2			33MHz or 50MHz system clock with slow VL-bus devices

CPU ADS# Signal Configuration

Some VL-bus interface card may need more address hold time (ADS#) in 486DX-50 or DX2-66. Otherwise, always keeps pin 2 and 3 of JP36 short.

CPU ADS# Signal Configuration	JP36
Normal Operation	
Delay CPU ADS# Signal	

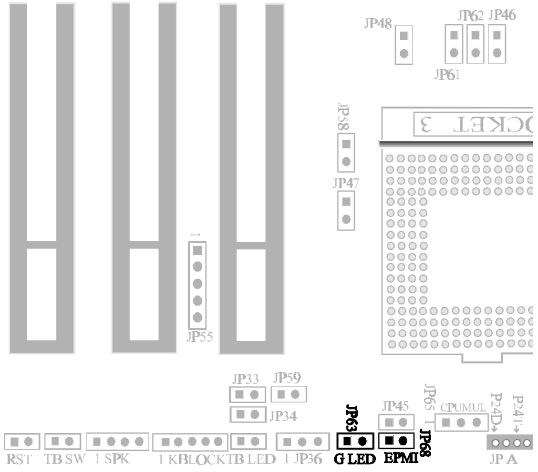
External Power Management Control Port

419 mainboard provides two External Power Management Control Ports, JP63 and JP68 to facilitate power saving.

When the system power management timeout occurs, pin 1 of JP63 goes down to low level from high. Once the system is resumed, JP63 pin 1 return to high. The JP63 can be connect to the Green Function Power Supply for monitor's power on/off control, or it can be connected to a LED as a power management indicator.

419 mainboard also provides an EPMI (External Power Management Interface) connector JP68. If there is an external power saving push button on your computer case, connect it to JP68.

When the button is pressed, it forces the system enter to power saving mode. When the button is pressed again, the system will resume from power saving mode.



Connectors

Connectors	
ITEM	FUNCTION
JP30	* Color/Monochrome Display Switch
PL1	Power Connector
KB1	Keyboard Connector
J1	External Battery Connector
J2	Power LED and KeyLock Connector
JP18	Speaker Connector
JP17	** Hardware Turbo Switch Connector
JP16	Turbo LED Connector
S1	Hardware Reset Connector
JP68	EPMI Connector
JP63	*** G-LED, Green Function Indicator Connector

* Close for Color, Open for Monochrome Display.
** 419 mainboard doesn't support software turbo switching.
*** JP63 (G-LED) also used as external power control port.

Factory Default Settings

Factory Default Settings	
JP53	Pin 1 - 2 Close
JP67	Close
JP74	Pin 2 - 3 Close
JP77	Pin 2 - 3 Close
JP79	Pin 1 - 2 Close

Chapter 3 Memory Configuration

419 mainboard provides great flexibility to support a number of different on-board DRAM configurations.

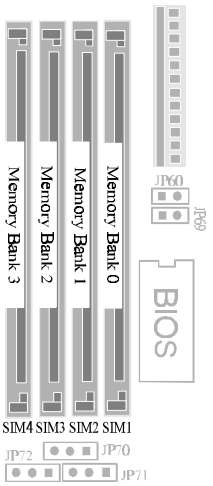
419 mainboard provides two memory configuration modes.

On mode 1, memory is organized into **four banks**, with one SIMM socket assigned to each memory bank. The mainboard supports 1MB, 4MB, 16MB, and 64MB fast-page mode 72-pin SIMMs in each socket.

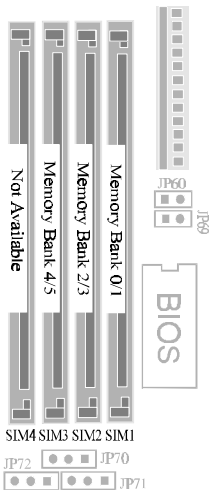
On mode 2, memory is organized into **six banks**, with one SIMM socket assigned to two memory banks, and only three SIMM sockets can be used. The mainboard supports 1MB, 2MB, 4MB, 8MB, 16MB, 32MB, and 64MB fast-page mode 72-pin SIMMs in each socket.

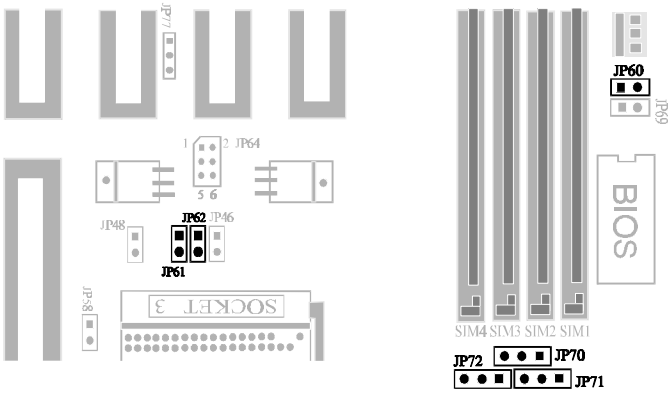
The following table shows the majority of memory configuration of 419 mainboard.

Memory Configuration mode 1



Memory Configuration mode 2





419 mainboard provides two memory configuration modes, mode 1 and mode 2.

Jumpers JP60, JP61, JP62, JP70, JP71, and JP72 are provided to configure the memory in one of two modes.

Note : 1. When memory configuration mode 1 is selected, 419 mainboard supports two VESA master mode Local-bus slots, one on J20 (VL-bus slot1), and the other on J19 (VL-bus slot 2) or J18 (VL-bus slot 3).

2. If memory configuration mode 2 is selected, 419 mainboard only supports one VESA master mode Local-bus slot on J18 or J19, J20 is assigned to slave.

Memory Configuration Mode Selection	
Mode 1	
Mode 2	

Memory Configuration Table - Mode 1

Memory Configuration Reference Table - Mode 1				
SIM1 BANK 0	SIM2 BANK 1	SIM3 BANK 2	SIM4 BANK 3	TOTAL
1MB	NONE	NONE	NONE	1MB
1MB	1MB	NONE	NONE	2MB
4MB	NONE	NONE	NONE	4MB
1MB	1MB	1MB	1MB	4MB
1MB	4MB	NONE	NONE	5MB
1MB	1MB	4MB	NONE	6MB
4MB	4MB	NONE	NONE	8MB
4MB	NONE	4MB	NONE	8MB
1MB	1MB	4MB	4MB	10MB
4MB	NONE	4MB	4MB	12MB
16MB	NONE	NONE	NONE	16MB
4MB	4MB	4MB	4MB	16MB
1MB	16MB	NONE	NONE	17MB
4MB	16MB	NONE	NONE	20MB
4MB	NONE	16MB	NONE	20MB
16MB	16MB	NONE	NONE	32MB
16MB	NONE	16MB	NONE	32MB
16MB	16MB	16MB	16MB	64MB
64MB	NONE	NONE	NONE	64MB
64MB	64MB	NONE	NONE	128MB
64MB	NONE	64MB	NONE	128MB

Memory Configuration Table - Mode 2

Memory Configuration Reference Table - Mode 2			
SIM 1 BANK 0/1	**SIM 2 BANK 2/3**	**SIM 3 BANK 4/5**	**TOTAL**
1MB	NONE	NONE	1MB
2MB	NONE	NONE	2MB
2MB	2MB	NONE	4MB
4MB	NONE	NONE	4MB
2MB	4MB	NONE	6MB
2MB	2MB	2MB	6MB
8MB	NONE	NONE	8MB
4MB	4MB	NONE	8MB
4MB	8MB	NONE	12MB
2MB	2MB	8MB	12MB
8MB	8MB	NONE	16MB
4MB	4MB	8MB	16MB
4MB	16MB	NONE	20MB
4MB	8MB	8MB	20MB
4MB	4MB	16MB	24MB
8MB	8MB	8MB	24MB
32MB	NONE	NONE	32MB
16MB	16MB	NONE	32MB
8MB	8MB	16MB	32MB
4MB	4MB	32MB	40MB
16MB	16MB	16MB	48MB
8MB	8MB	32MB	48MB
16MB	16MB	32MB	64MB
64MB	NONE	NONE	64MB
32MB	32MB	NONE	64MB
32MB	32MB	32MB	96MB
64MB	64MB	NONE	128MB

Chapter 4 BIOS Setup

BIOS Setup configures system information that is stored in CMOS RAM. WINBIOS Setup has an easy-to-use graphical user interface that will be immediately recognizable to anyone who has ever used Microsoft Windows. WinBIOS Setup sets a new standard in BIOS user interfaces.

Starting WinBIOS Setup

As POST executes, the following message appears :

Hit <DEL> if you want to run SETUP

Press <Del> to run WinBIOS Setup.

Bus Mouse and Microsoft Mouse Support on BIOS Setup :

The following types of mouse devices are supported.

* PS/2- type mouse.

* Bus mouse that use IRQs 3, 4, or 5 (IRQ2 is not supported).

* Microsoft-compatible mouse.

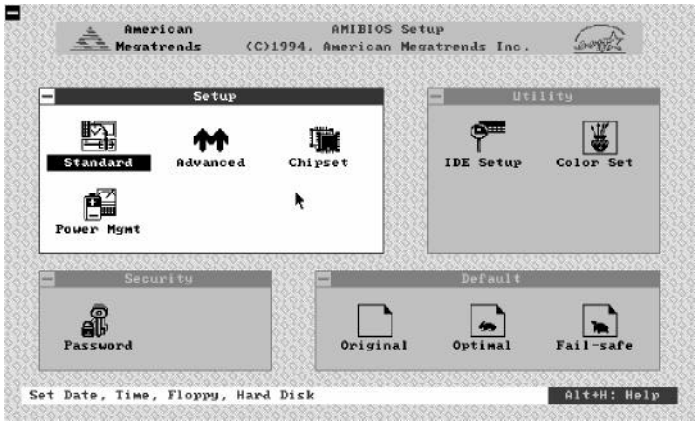
* Logitech C-series-compatible mouses using the MM protocol.

WinBIOS Setup can be accessed via keyboard, mouse, or pen. The mouse click functions are :

single click to change or select both global and current field and double click to perform an operation in the selected field.

BIOS Setup Feature

The WinBIOS Setup main menu, shown below, is organized into four windows. Each window corresponds to a section in this chapter.



Each section contains several icons. Clicking on each icon activates a specific function. The WinBIOS Setup icons and functions are described in this chapter. The sections are :

Setup

This section has five icons that permit you to set system configuration options such as date, time hard disk type, floppy type, chipset parameter, power management, and peripheral I/O setup.

Utilities

This section has four icons that perform system functions.

Security

This section has one icon that control WinBIOS security features.

Default

This section has three icons that permit you to select a group of settings for all WinBIOS Setup options.

Each WinBIOS Setup option has two default settings. These settings can be applied to all WinBIOS Setup options when you select the Default section on the WinBIOS Setup main menu. The types of default are:



Optimal These settings provide that best performance characteristics.



Fail-Safe These settings are more likely to configure a workable computer when something is wrong. If you cannot boot the computer successfully, select the Fail-Safe WinBIOS Setup options and try to diagnose the problem after the computer boots. These settings do not provide optimal performance.

Using the Keyboard with WinBIOS Setup

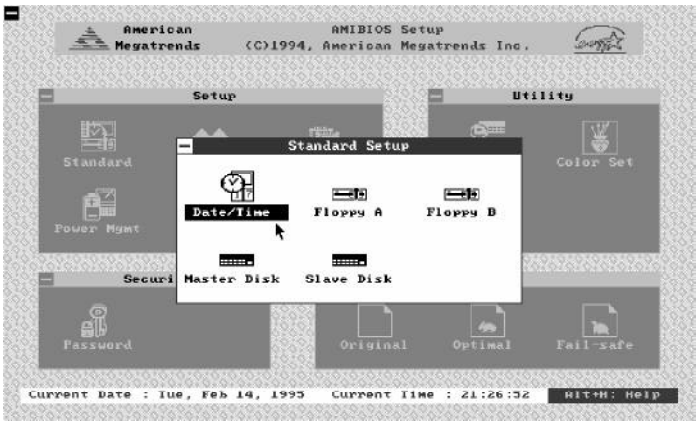
WinBIOS Setup has a built-in keyboard driver that uses simple keystroke combinations :

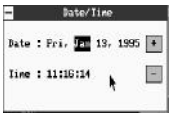
Keystroke	Function
<Tab>	Move to the next window or field.
⇨⇦⇧⇩	Move to the next field to the right, left, above, or below.
<Enter>	Select in the current field.
+	Increments a value.
-	Decrements a value.
<Esc>	Closes the current operation and return to previous level.
<PgUp>	Returns to the previous page.
<PgDn>	Advances to the next page.
<Home>	Returns to the beginning of the text
<End>	Advances to the end of the text.
<Alt><H>	Access a help window.
<Alt><Spacebar>	Exit WinBIOS Setup.
Alphabetic keys	A to Z are used in the Virtual Keyboard, and are not casesensitive.
Numeric Keys	0 to 9 are used in the Virtual Keyboard and Numeric Keypa

Standard Setup



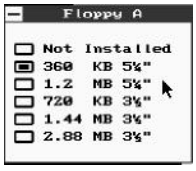
The WinBIOS Standard Setup option described in this section are selected by choosing the appropriate high-level icon from the WinBIOS Setup main menu selection screen. The selection window follows.





Date, Day and Time Configuration

Select the Standard option. Select the Date and Time icon. The current values for each category are displayed. Enter new values through the keyboard.



Floppy Drive A:, Floppy Drive B:

Move the cursor to these fields via and select the floppy type. The settings are *360KB 51/4 inch, 1.2MB 51/4 inch, 720KB 31/2 inch, 1.44MB inch,*





or 2.88MB 31/2 inch .

Hard Disk C: Type, Hard Disk D: Type

Select one of these hard disk drive icons to configure the drive named in the option. A scrollable screen that lists all valid disk drive types is displayed. Select the correct type and press <Enter>. If the hard disk drive is an IDE drive, select IDE Setup from the Utility section of the WinBIOS Setup main menu to allow WinBIOS to automatically detect the IDE drive parameters and report them on this screen.



Using IDE Setup

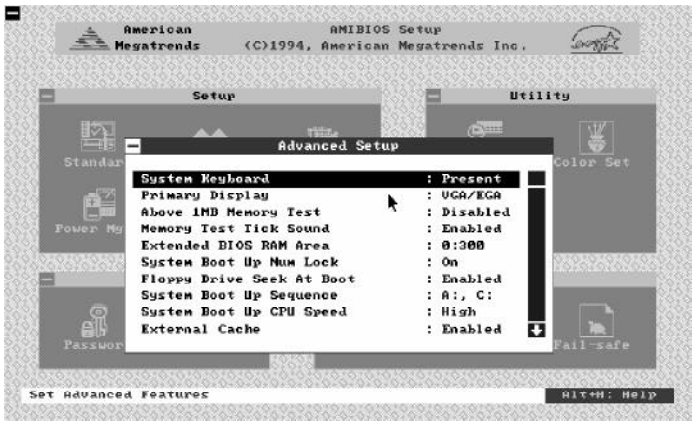
If you select *IDE Setup* from the Utility section of the WinBIOS Setup main menu, WinBIOS automatically finds up to four IDE hard disk drives parameter. WinBIOS places the hard disk drive parameters that it finds in the Hard Disk Drive Type fields in Standard Setup.



Advanced Setup



The WinBIOS Advanced Setup options described in this section are selected by choosing the appropriate high-level icon from the WinBIOS Setup main menu. The selection window is shown below.



System Keyboard

This option does not specify if a keyboard is attached to the computer. Rather, it specifies if error messages are displayed if a keyboard is not attached. This option permits you to configure workstations with no keyboards. The settings are *Absent* or *Present*.

Primary Display

Select this icon to configure the type of monitor attached to the computer. The settings are *Monochrome, Color 40 x 25, Color 80 x 25, VGA/PGA/EGA,* or *Not Installed*.

Above 1 MB Memory Test

When this option is enabled, the WinBIOS memory test is performed on all system memory. When this option is disabled, the memory test is done only on the first 1 MB of system memory. The settings are *Enabled* or *Disabled*.

Memory Test Tick Sound

This option enables or disables the ticking sound during the memory test. The settings are *Enabled* or *Disabled*.

Extended BIOS RAM Area

Specify in this option if the top 1 KB of the system programming area beginning at 639K or 0:300 in the system BIOS area in low memory will be used to store hard disk information. The settings are Top *1K* or *0:300*.

System Boot Up Num Lock

When *On*, this option turns off *Num Lock* when the system is powered on so the end user can use the arrow keys on both the numeric keypad and the keyboard. The settings are *On* or *Off*.

Floppy Drive Seek At Boot

When this option enabled, WinBIOS performs a Seek command on floppy drive A: before booting the system. The settings are *Enabled* or *Disabled*.

System Boot Up Sequence

This option sets the sequence of boot drive (either floppy drive A; or hard disk drive C:) that WinBIOS attempts to boot from after POST completes. The settings are *C:, A:* or *A:, C:*.

System Boot Up CPU Speed

This option sets the speed of the CPU at system boot time. The settings are *High* or *Low*.

External Cache

This option enabled or disabled secondary cache (L2) memory.

Internal Cache

This option enabled or disabled the internal cache memory in the 486 processor.

Password Checking

This option enables the password check option every time the system boots or the end user runs Setup. If *Always* is chosen a user password prompt appears every time the computer is tuned on. If *Setup* is chosen, the password prompt appears if WinBIOS is executed.

Video ROM Shadow C000, 32K

When this option is set to Enabled, the video ROM area from C0000h ~ C7FFFh is copied (shadowed) to RAM for faster execution. The settings are *Absent*, *NoShadow*, or *Shadow*.

Shadow xxxx, 16K,

These options enable shadowing of the contents of the ROM area named in the option title. The settings are *Absent*, *NoShadow*, or *Shadow*. The ROM area that is not used by ISA adapter cards will be allocated to PCI adapter cards.

IDE Block Mode

If your hard disk drive supports IDE block transfer mode, enable this option for faster IDE hard disk drive transfer rate.

IDE Drivers Standby Timer

This option specifies the length of time of hard disk drive inactivity that must expire before the IDE hard disk drive is placed in IDE HDD Power Down. The settings are from 1 min to 15 min or disabled. HDD Power Down can be an individual feature with independent timer and not infected by **Power Management Mode Select**.

ATTENTION

Some IDE hard disk drives may not power down even if the **IDE Standby Timer** is *selected. Those hard disk drives do not accept the BIOS IDE power down command because of their build-in old version firmware.*

Pri. IDE 32 Bit Mode

IDE 32-bit transfers will enhance data transfer rate on IDE interface, but only 32-bit PCI IDE controller supports it on this mainboard.

Pri. Master/Slave LBA Mode

If your primary master/slave IDE hard disk over 528MB, please enables this LBA (Large Block Addressing) mode feature.

Sec. IDE Ctrl Drives Installed

This feature specifies how many IDE hard disk drive connect to secondary channel port. The options are ***Master, Mst/Slv,*** and ***Disabled***.

Sec. IDE 32 Bit Mode

IDE 32-bit transfers will enhance data transfer rate on IDE interface, but only 32-bit PCI IDE controller supports it on this mainboard.

Sec. Master/Slave LBA Mode

If your secondary master/slave IDE hard disk over 528MB, please enables this LBA (Large Block Addressing) mode feature.

Chipset Setup

The WinBIOS Chipset Setup options described in this section are selected by choosing the appropriate high-level icon from the WinBIOS Setup main menu. The selection window is shown below.



Auto Configuration Function

When this option is *Enabled*, BIOS automatically configures listed features based on detection of the CPU clock frequency. when this option is *Disabled*, BIOS leave these features manually adjust by the user.

Recommended Chip Setup for Different System Clock					
FEATURE	20 MHz	25 MHz	33 MHz	40 MHz	50 MHz
AT Cycle Wait States	Disabled	Disabled	Enabled	Enabled	Enabled
AT Bus Clock Selection	CLKI / 3	CLKI / 3	CLKI / 4	CLKI / 5	CLKI / 6
DRAM Burst Cycle	' 3-2-2-2	'3-2-2-2	'4-3-3-3 *	'4-3-3-3	'5-4-4-4
Memory Write Wait States	0 W/S	0 W/S	0 W/S	1 W/S	1 W/S
Cache Write Cycle	0 W/S	0 W/S	1 W/S	1 W/S	1 W/S
Cache Read Cycle	'2-1-1-1	'2-1-1-1	'3-1-1-1	'2-2-2-2	'3-2-2-2
AT Cycle Between IO Cycle	0	0	0	3	0

Hidden Refresh

Hidden refresh is performed independent of the CPU as long as the CPU does not try to access local memory or the AT bus during a hidden refresh cycle, refresh will be transparent to the CPU. The CPU can continue to execute from its internal cache and execute internal instructions during hidden refresh without any loss in performance due to refresh arbitration.

AT Cycle Wait State

If the option is *Enabled*, the chip will insert one extra wait state in standard AT bus cycle. The options are *Enabled* or *Disabled*.

AT Cycle Between I/O Cycle

This feature allows the user to select 3 or no back to back I/O delay.

AT Bus Clock Selection

This option is used to select I/O bus lock settings. Possible settings are derived from, and vary according to, system clock. For example, at a system clock speed of 50MHz, selecting CLKI/6 would result in a bus clock speed of 8.33MHz. The optimal setting depends on system clock speed and the speed rating of installed adapter cards, but it is highly recommended that 8.33MHz I/O bus clock speed be used to ensure compatibility with ordinary adapter cards.

CLKI/3 for 20MHz, and 25MHz system
CLKI/4 for 33MHz system
CLKI/5 for 40MHz system
CLKI/6 for 50MHz system

AT Bus Clock Control

The feature allows the user to select AT Bus Clock derived from system clock (*Synchronous*), or from 14.318MHz/2 (*Asynchro*).

Fast AT Cycle

This feature allows the user to select Fast AT Cycle *Enabled* or *Disabled*.

DRAM Burst Cycle

This feature allows the user to select four DRAM burst cycles, 3-2-2-2, *4-3-3-3, 4-3-3-3, and 5-4-4-4. The optimal setting depends on system clock speed. 3-2-2-2 for clock speed of 20MHz and 25MHz, *4-3-3-3 for clock speed of 33MHz, 4-3-3-3 for clock speed of 40MHz, and 5-4-4-4 for clock speed of 50MHz.

Memory Write Wait State

This feature allows the user to select between two memory write settings, zero and one memory write wait states. The optimal setting depends on system clock speed. One memory write wait state for clock speed of 33MHz or higher, zero for clock speed below 33MHz.

Internal Cache Write Back

This option selects the type of caching algorithm used by BIOS

Cache Read Cycle

This feature allows the user to select four cache read burst cycles, 2-1-1-1, 3-1-1-1, 2-2-2-2, and 3-2-2-2. The optimal setting depends on system clock speed, 2-1-1-1 for clock speed of 25MHz or lower, 3-1-1-1 and 2-2-2-2 for clock speed 33MHz, and 3-2-2-2 for clock speeds of 40 and 50MHz.

Cache Write Wait State

This feature allows the user to select between two cache write settings, zero and one cache write wati states. The optimal setting depends on system clock speed. One memory write wait state for clock speed of 33MHz or higher, and zero for clock speed below 33MHz.

Non-Cacheable Block-1 Size

This feature provides one of two non-cacheable blocks on system memory. The optional block sizes are *64KB, 128KB, 256KB*, and *1MB* or *Disabled*.

Non-Cacheable Block-1 Base

This feature assigns one of two non-cacheable block base address on system memory. The starting address for the non-cacheable block must have the same granularity as the block size. For example, if a 256KB non-cacheable block is selected, its starting address is a multiple of 256KB.

Video Cacheable C000, 32K

This feature allows the user to set whether the video BIOS in C000~C7FF area are cacheable or non-cacheable.

Cacheable Adaptor ROM

This feature allows the user to set whether the adapter BIOS in xxxxh, a 16KB block size (Shadowed) area is cacheable or non-cacheable.

Power Management Setup



The WinBIOS Power Management Setup options described in this section are selected by choosing the appropriate high-level icon from the WinBIOS Setup main menu. The selection window is shown below.



Power Management Mode Select

419 mainboard provides two Power Management Mode, Auto_mode for non S-series dynamic CPU and SMI_mode for S-series CPU.

System Timeout

This option specifies the length of time of system entering Auto_mode or SMI_mode power management state. The timer options are *15sec, 2min, 5min, 15min, 30min, 45min, 1hr,* or *4hr*. The timer can be reloaded by any IRQs and local bus, keyboard, video, hard disk and floppy disk access.

IRQ1 (~ 15) Monitor

Enabling these options allows the IRQs (Interrupt Requests) input to be monitored for both inactivity for entering Auto_mode/SMI_mode and activity for entering Normal_mode.

IRQ1 : Keyboard IRQ3 : COM2, 4
IRQ4 : COM1,3 IRQ5 : LTP2
IRQ6 : Floppy Disk IRQ7 : LTP1
IRQ9 : RedirectionIRQ2
IRQ10, 11, 12, 15 : Reserved

DRQ 0 ~ 7 Monitor

Enabling these options allows the DRQs (DMA Requests) input to be monitored for both inactivity for entering Auto_mode/SMI_mode and activity for entering Normal_mode.

LRQ Monitor

Enabling these options allows the LRQ (Local Bus Requests) input to be monitored for both inactivity for entering Auto_mode/SMI_mode and activity for entering Normal_mode.

Keyboard IO Port Monitor

Enabling this option allows to access to port 60h and 64h to be monitored for both entering and exiting Auto_more/SMI_mode.

Floppy IO Port Monitor

Enabling this option allows floppy port (3F5h) access to be monitored for both entering and exiting Auto_mode/SMI_mode.

Hard Disk IO Port Monitor

Enabling this option allows hard disk port (1F0h to 3F6h) access to be monitored for both entering and exiting Auto_mode/SMI_mode.

Video IO Port Monitor

Enabling this option allows video IO port to be monitored for both entering exiting Auto_mode/SMI_mode.

Screen Sleep

This option specifies screen sleep when the system enters Auto_mode or SMI_mode power management state. If the options is *Sleep*, when the system enters to Auto/SMI_mode, the screen turns to blank. If the option is *Non-Sleep*, when the system enters to power management the screen will slow down in Auto_mode and freeze in SMI_mode..

APM Function

This option specifies if the system enabled or disabled **APM** (Advanced Power Management) function.

FCC Notice:

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy. If not installed and used properly, in strict accordance with the manufacturer's instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures :

Reorient or relocate the receiving antenna.

Increase the separation between the equipment and receiver.

Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

Consult the dealer or an experienced radio/television technician for helpand for additional suggestions.

The user may find the following booklet prepared by the Federal Communications Commission helpful "How to Identify and Resolve Radio-TV Interference Problems." This booklet is available from the U.S. Government Printing Office. Washington, DC 20402, Stock 004-000-00345-4

FCC Warning

The user is cautioned that changes or modifications not expressly approved by the manufacturer could void the user's authority to operate this equipment.

Note : In order for an installation of this product to maintain compliance with the limits for a Class B device, shielded cables and power cord must be used.