TM-BX370P TM-VA370P
ISA/ PCI/ AGP Mainboard

Onboard Debug

Version: 1.1

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Printed in Taiwan

Overview

The TM-BX370P \ VA370P is a PPGA-Celeron based mainboard that utilizes Intel BX and VIA 693A+596B chipset, a high level of integrated function. This mainboard is designed for Celeron & CuMine FC-PGA CPU, and support new architectures such as high speed AGP graphic port , ATA/33 (Intel BX) ATA/66(VIA) Bus Master IDE, SDRAM memory and expandable to a maximum 512MB. There is no second level cache onboard since the cache is on the CPU.

In addition to above features, this mainboard implements most advanced technology such as Synchronous switching regulator, CPU thermal protection, CPU fan monitoring, System voltage monitoring, Over currentt protection, Modem Wake Up, Keyboard Power On, PS/2 mouse Power On, Debug sensor on board.

The most unique feature of the board is its capability to debug onboard or externally via the connection of external 3.5" Debug Drive Bay (Referring to page 52). When the CPU, DRAM, FDD, or VGA cards have not been properly installed, a DIY user can isolate problems through reading the Debug display and instructions in the manual. To professional system test engineers or maintenance engineers, the Debug display can work as an 80 Port Debug Card. In other words, they can use this debug sensor function to do testing and maintenance in lieu of the 80 Port Debug card.

CONTENTS

Introduction

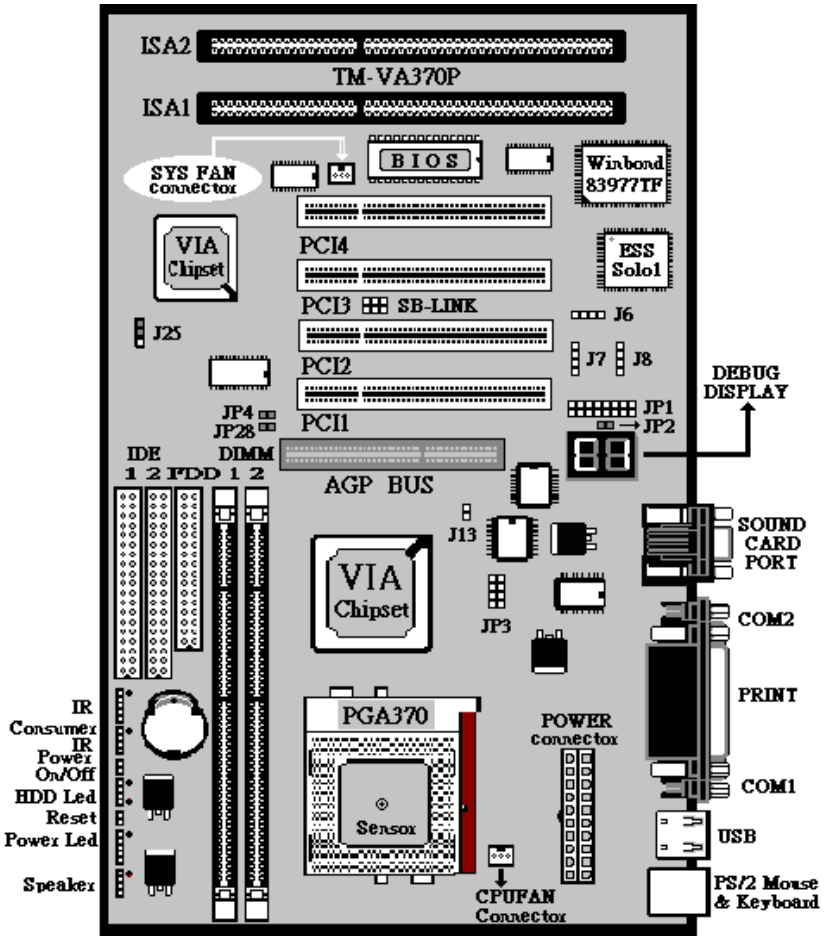
A. Specifications

System Chipset	Intel 82443BX or VIA 693A+596B chipset.
CPU	Intel PPGA-Celeron processors, support 300/333/ 366/400/433/466/500/533/566/600 (Ex. Clk 66 MHz); CuMine FC-PGA 450/500/550/ 600/ 650/ 700/750/ 800 (Ex. Clk 100 MHz); CuMine FC-PGA 533/600/667/733/800 (Ex.Clk 133 MHz) CPU.
Memory	Expandable to 512MB (2 banks) with two 168-pin DIMM socket {support 3.3 V EDO (66MHz only) / SDRAM (66/100 &133 MHz for VIA chipset)}.
I/O	Two high speed 16550 compatible serial ports, one Multi-Mode. Parallel Port support SPP/EPP/ECP standard mode. Two onboard PCI IDE Ports (32-bit data transfer). LS-120/ ZIP FDD, IrDA/ ASK IR/ Consumer IR. Dual USB ports Support two 360/720KB/1.2/1.44/2.88MB floppy disk devices. One PS/2 Mouse port.
BIOS	Award System BIOS installed in socket (Flash and PnP).
Expansion slots	One AGP slot, four PCI Master Slots and two 16-bit ISA Slots.
Voltage	Auto
Dimension	4-layer PCB, size (300mm x 180mm).
Others	CPU Auto Temperature Sensor & Music Alarm, voltage monitor and CPU Fan monitor, Bus

Master/ Ultra DMA/33, ATA/66, ACPI, AGP Bus, Keyboard Power On, PS/2 Mouse Power On,Modem Ring On, LAN Wake Up, Sound on board, Debug on board.

Setup Guide

A.Layout Diagram



B. Jumper Settings

- **Power ON/OFF (For ATX Power Supply) :**
  The button should be a momentary switch that is normally open. Pushing the ATX Power Switch will immediately change the system Status. Before or during "POST", it takes 4 seconds to turn off the system.
- **JP1 :** External Debug display connector.
- JP2 :

JP2	
Open	**External Debug Display**
Short	**On Board Debug Display**

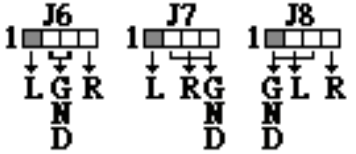
- **JP3 : Clock Ratio Table**

Ratio	1-2	3-4	5-6	7-8
2.0x	On	On	On	On
2.5x	On	On	Off	On
3.0x	On	Off	On	On
3.5x	On	Off	Off	On
4.0x	Off	On	On	On
4.5x	Off	On	Off	On
5.0x	Off	Off	On	On
5.5x	Off	Off	Off	On
6.0x	On	On	On	Off
6.5x	On	On	Off	Off
7.0x	On	Off	On	Off
7.5x	On	Off	Off	Off

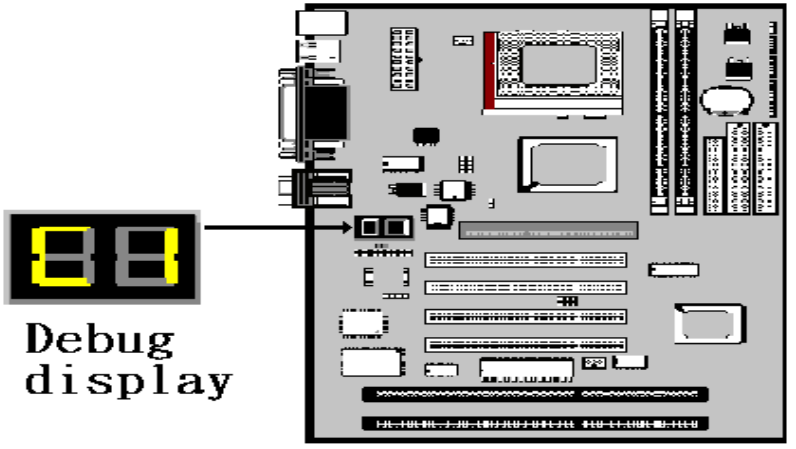
- JP25 : Clear CMOS

JP25	
1-2	**Normal Operation (Default)**
2-3	**For Clearing CMOS Data**

- **SB-Link : J6, J7, J8**



C.LED Debug & Voice Debug On Board

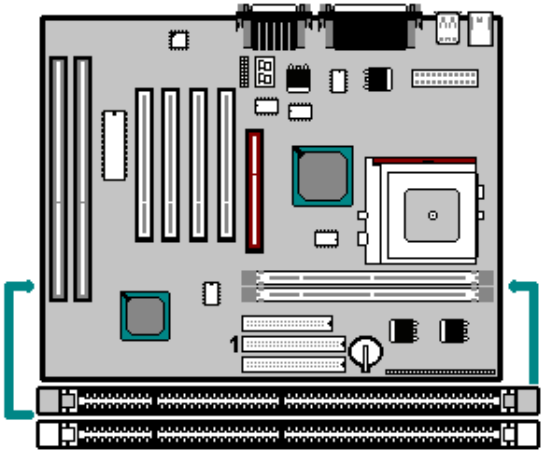


Error Message	LED Error code	Voice Debug
DRAM defect or improper connection	**C1\C6**	Please check memory.
CPU defect or improper connection	**FF**	Please check CPU.
Display card defect or improper connection	**OD**	Please check display card or memory.
Cache RAM Defect	**61**	Please check Cache RAM
Keyboard defect	**05**	Please check keyboard.
Floppy defect or improper connection	**4E**	Please check Floppy Disk Drive connector or BIOS.
When CPU temperature over the set point.		Your CPU temperature is too high.
When Mainboard was seriously demaged in some of components.	Refer to page 52-56 for other Error Codes.	The Mainboard components may be demaged, please sent it bck to your supplier for repairing.

CPU Voltage and Frequencies

Celeron-370 CPU is a frequency fixed CPU. The CPU type and working voltage for the CPU shall be automatically detected.

E. EDO/ SDRAM Installation Procedures:



- A 168-pin DIMM can support up to 512MB 3.3V EDO/ SDRAM .
- To avoid compatibility and reliability problems, you are recommended to test the 168-pin SDRAMs before buying them since the PCB specifications differ.
- First, verify the working voltage of the EDO/ SDRAM module in either DIMM socket.
- BV370M only supports 3.3V EDO/ SDRAM module. The following illustration shows you the difference between 3.3V and 5V to ensure your correct selection of 3.3V DIMM module for using.
- You can set up the BIOS "Chipset Feature Setup" to the best working condition basing on the type of EDO/ SDRAM you are using.

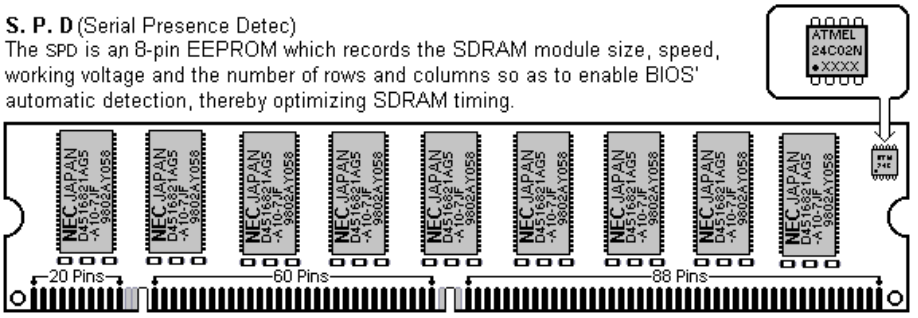
- The BIOS DRAM default setting is 60 ns. Change the BIOS "Chipset Feature Setup" default setting to 50ns for better performance, if the chipset is marked 50ns.

- Change nothing if EDO RAM is used. BIOS automatically detect the RAM type.

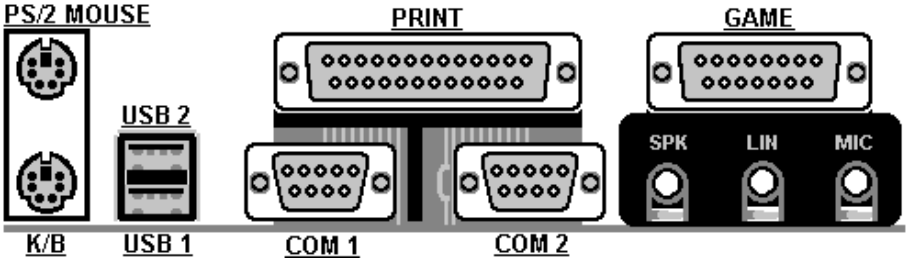
- MEMO for Installing System:
  ⊕ Concerning memory setup, you can find how to from **"Chipset Feature Setup"** under BIOS setup. However, to avoid system unstable or system hang, user without engineering background is not suggested to change BIOS set up.
  ⊕ If system boot failure, please clean DIMM socket **(with clean oil)** or polish **Gold-Finger** of DRAM with **soft eraser**, and try again.

- The Dual Inline Memory Module (DIMM) must be 3.3 Volt and Unbuffered Synchronous DRAM (SDRAM) 8MB, 16MB, 32MB, 64MB, 128MB or 256MB. The following illustration shows the type of DIMM Module.

S. P. D (Serial Presence Detec)
The SPD is an 8-pin EEPROM which records the SDRAM module size, speed, working voltage and the number of rows and columns so as to enable BIOS' automatic detection, thereby optimizing SDRAM timing.



168-PIN PC-100 SDRAM DIMM Notch Key Definitions



F. BIOS Update Note

Do not update the BIOS if no abnormalities occur. However, if BIOS update is needed, consult your dealer first. Prior to updating your BIOS, you are recommended to save the original BIOS values.

1. Download the AWARD BIOS Flash Utility file (**Awdflash.exe**)

2. Download the BIOS file used by your mainboard(**e.g., BXV110N.BIN**)

3. **Reboot** your system (but do not run **Himem.sys** and **Emm386.exe**) to
   execute the new BIOS program.

4. Execute these commands: **Awdflash BXV110N.BIN**

5. When this message displays: "**Do you want to save BIOS (Y/N)?**"
   Type "**N**"

6. When this message displays: "**Are you sure to program (Y/N)?**"
   Type "**Y**"

7. **Turn off** power to your system to clear the CMOS data.

8. Turn on the power to test if your system is running normal.

G. Keyboard/ PS/2 Mouse Power On and MODEM Ring on

- **To make sure the 5VSB signal nearly to 750mA (Amperage) from ATX Power Supply, or if your keyboard consuming power than 300mA, it's better to upgrade your ATX Power Supply to 1A for working perfectly.**
- If you are going to use the function of keyboard and PS/2 mouse power on, then, the power-switch will be becoming useless automatically (unable to be used).

ROM PC/ISA BIOS (2A6LGTJE)
INTEGRATED PERIPHERALS
AWARD SOFTWARE, INC.

IDE HDD Block Mode	: Enabled	Onboard Serial Port 2	: 2F8H / IRQ3
IDE Primary Master PIO	: AUTO	UART Mode Select	: Normal
IDE Primary Slave PIO	: AUTO		
IDE Secondary Master PIO	: AUTO	Onboard Parallel Port	: 378H/IRQ 7
IDE Secondary Slave PIO	: AUTO	Parallel Port Mode	: ECP+EPP
IDE Primary Master UDMA	: AUTO	ECP Mode Use DMA	: 3
IDE Primary Slave UDMA	: AUTO	EPP Mode Select	: EPP 1.9
IDE Secondary Master UDMA	: AUTO		
IDE Secondary Slave UDMA	: AUTO		
On-Chip Primary PCI IDE	: Enabled		
On-Chip Secondary PCI IDE	: Enabled		
USB Keyboard Support	: Disabled		
Init AGP Display First	: Enabled		
POWER ON Function	**: Hot KEY**		
Hot Key Power ON	**: Ctrl-F12**	Esc : Quit	↑↓→← Selection : Item
KBC input clock	: 8MHz	F1 : Help	PU/PD/+/- : Modify
Onboard FDC Controller	: Enabled	F5 : Old Values	(Shift)F2 : Color
Onboard Serial Port 1	: 3F8H / IRQ4	F6 : Load BIOS Default	
		F7 : Load Setup Default	

Hot KEY	When user select this option, it will show another line lines as Hot Key Power ON: **Ctrl-F(1/2/3/4/5/6/7/8/9/10/11/12)** select any you like. After power off, if user key in the "Ctrl-F?", it will power on the system.
PS/2 Mouse Left	It will power on the system by PS/2 mouse left.
PS/2 Mouse Right	It will power on the system by PS/2 mouse Right.

Button Only	Only the power button can power on the system.

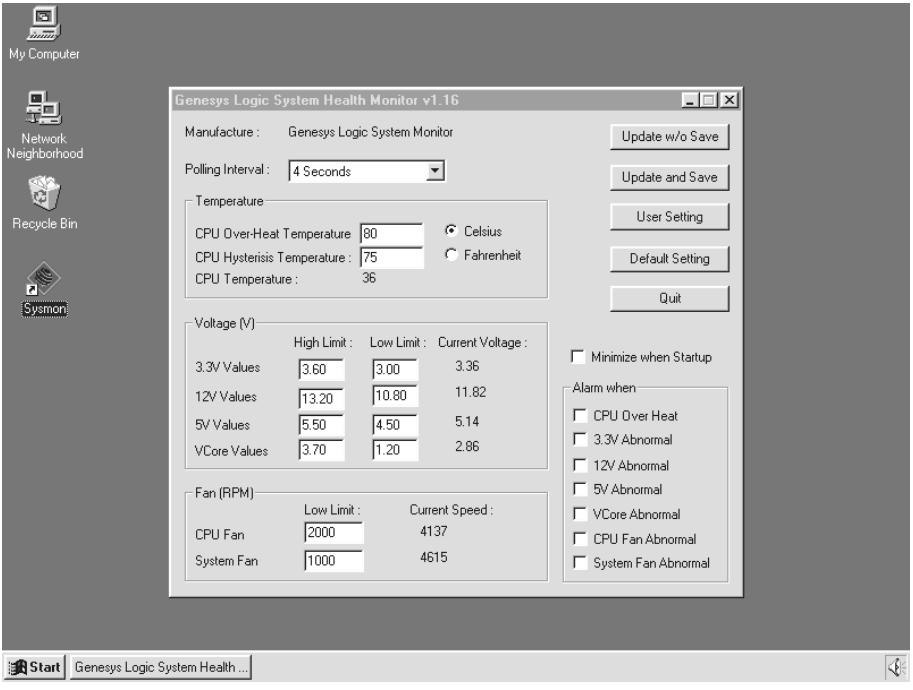
- **Modem Ring On Function Operation:**

ROM PCI / ISA BIOS (2A6LGTJE)
POWER MANAGEMENT SETUP
AWARD SOFTWARE, INC

Power Management	: Disabled	** Reload Global Timer Events **	
PM Control by APM	: No	IRQ[3-7, 9-15], NMI	: Enabled
Video Off Method	: V/H SYNC+Blank	Primary IDE 0	: Disabled
Video Off After	: Standby	Primary IDE 1	: Disabled
MODEM Use IRQ	: 3	Secondary IDE 0	: Disabled
Doze Mode	: Disabled	Secondary IDE 1	: Disabled
Standby Mode	: Disabled	Floppy Disk	: Disabled
Suspend Mode	: Disabled	Serial Port	: Enabled
HDD Power Down	: Disabled	Parallel Port	: Disabled
Throttle Duty Cycle	: 62.5%		
ZZ Active in Suspend	: Disabled		
VGA Active Monitor	: Enabled		
Soft-Off by PWR-BTTN	: Instant-Off		
CPUFAN Off In Suspend	: Enabled		
Resume by Ring	**: Enabled**		
IRQ 8 Clock Event	: Disabled	Esc : Quit ↑↓→←Selection Item	
		F1 : Help	PU/PD/+/- : Modify
		F5 : Old Values	(Shift) F2 : Color
		F6 : Load BIOS Default	
		F7 : Load Setup Default	

1. Have an external MODEM connected to COM 1 or COM 2.
2. Enter BIOS setup.
3. Select Power Management Setup.
4. **This number of MODEM use IRQ has to be set as same as the IRQ of Serial Port which you are connecting in. Please set in N/A if you are not going to use the function of MODEM ring on.**
5. **Resume by Ring: Enable.**
6. Save BIOS setup and Reboot.
7. Booting from DOS, Windows, or Windows 95.
8. Turn off the system by:
   a. ATX-Power Switch
   b. Windows 95 Software Power Off
9. System Waiting for Modem Ring On
   When Modem Ringing Signal Active, System will wake-up.

System Health Monitor



- **Fan Monitoring:**

  There are two fan connectors, one is for CPU, the other can be a housing fan. When the fans speed is working abnormal, there will be warning **(Speaker Alarm)** through application software such as SM10(Small Icon for System Monitoring) to notify user. The fan monitoring function is implemented by connecting fan to 3-pin fan connector FAN1/ FAN2 and installing SM10.

- **CPU Thermal Protection:**

  TM-P2BX370 implements special thermal protection circuits. When **temperature** is higher than a predefined value, there will be warning (Speaker Alarm) through application software such as SM10 (Small Icon for System Monitor) to notify user. It's automatically implemented by BIOS or SMD10, no hardware installation is needed. Referring to Page19 (System Health Monitor).

  This mainboard also reserves an option to use special CPU cooling Fan. With **Thermal Sensor** on it. The CPU thermal sensor should be connected to **J16**.

- **System Voltage Monitoring:**

  This board is featured with a voltage monitoring system. When you turn on your system, this smart design will keep on monitoring your system working voltage. If any of voltage is over the component's standard, there will be Speaker Alarm though application software SM10 (Small Icon For System Monitor) for a warning to user. System voltage monitoring function monitors 5V, 12V, 3.3V and CPU voltage. It's automatically implemented by BIOS and SM10, no hardware installation is needed. Referring to Page 19 (System Health Monitor)

Award BIOS Setup

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

Entering Setup

To enter the BIOS Setup, press <Del> during POST (Power-On-Self-Test).

Control Keys

Up Arrow	Move to previous item
Down Arrow	Move to next item
Left Arrow	Move to the left item
Right Arrow	Move to the right item
Esc Key	Main Menu -- Quit and not to save changes to CMOS Status Page setup menu and Option Page Setup Menu -- Exit current page and return to Main Menu
PgUp Key	Increase the numeric value or make changes
PgDn Key	Decrease the numeric value or make changes
F1 Key	General help, only for Status Page Setup Menu and Option Setup Menu
F2 Key	Change color from total 16 colors
F3 Key	Calendar, only for Status Page Setup Menu
F4 Key	Reserved
F5 Key	Restore the previous CMOS value from BIOS, only for Option Page Setup Menu
F6 Key	Load the default CMOS value from BIOS default table, only for Option Page Setup Menu
F7 Key	Load the default
F8 Key	Reserved
F9 Key	Reserved
F10 Key	Save all the CMOS changes, only for Main Menu

A. Getting Help

Main Menu
The online description of the highlighted setup function is displayed at the bottom of the screen.

Status Page Setup Menu/Option Page Setup Menu
Press F1 to pop up a small help window that describes the appropriate keys to use and the possible selections for highlighted item. To exit the Help Window press <Esc>.

B. The Main Menu

Once you enter Award BIOS CMOS Setup Utility, the Main Menu will appear on the Screen.. Use arrow keys to select the desired items, press <Enter> to select or enter a submenu.

ROM PC/ISA BIOS (2A6LGTJE)
CMOS SETUP UTILITY
AWARD SOFTWARE, INC.

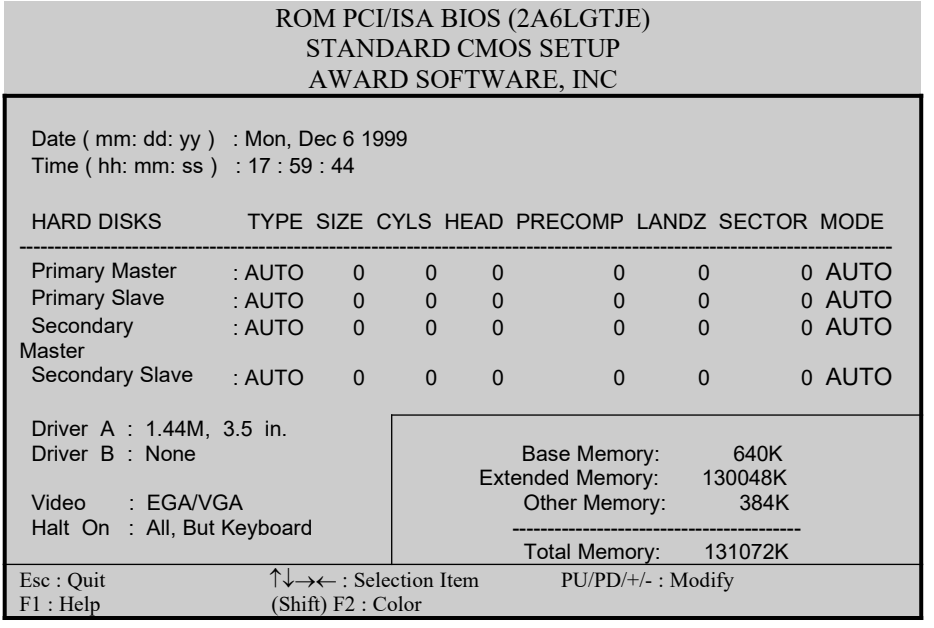
STANDARD CMOS SETUP	INTEGRATED PERIPHERALS
BIOS FEATURES SETUP	SUPERVISOR PASSWORD
CHIPSET FEATURES SETUP	USER PASSWORD
POWER MANAGEMENT SETUP	IDE HDD AUTO DETECTION
PNP/PCI CONFIGURATION	SAVE & EXIT SETUP
LOAD BIOS DEFAULTS	EXIT WITHOUT SAVING
LOAD SETUP DEFAULTS	

Esc : Quit	←↑↓→ : Select Item
F10 : Save & Exit Setup	(Shift) F2 : Change Color

Time, Data, Hard Disk Type...

AWARD BIOS Setup
1. Standard CMOS Setup

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



AWARD BIOS Setup
2. BIOS Features Setup

ROM PCI/ISA BIOS (2A6LGTJE)
BIOS FEATURE 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
CPU L2 Cache Checking	: Enabled	D0000-D3FFF Shadow	: Disabled
		D4000-D7FFF Shadow	: Disabled
Quick Power On Self Test	: Disabled	D8000-DBFFF Shadow	: Disabled
Boot Sequence	: A, C, SCSI	DC000-DFFFF Shadow	: Disabled
Swap Floppy Drive	: Disabled		
Boot Up Floppy Seek	: Enabled		
Boot Up NumLock Status	: On		
IDE HDD Block Mode	: Enabled		
Gate A20 Option	: Fast		
Memory Parity/ECC Check	: Disabled		
Typematic Rate Setting	: Disabled		
Typematic Rate (Chars/Sec)	: 6		
Typematic Delay (Msec)	: 250	ESC: Quit	↑↓→elect Item
Security Option	: Setup	F1 : Help	PU/PD/+/- : Modify
PCI/VGA Palette Snoop	: Disabled	F5 : Old Values	(Shift) F2 : Color
OS Select For DRAM > 64MB	: Non-OS2	F6 : Load BIOS Defaults	
		F7 : Load Setup Defaults	

Virus Warning
This category flashes on the screen. During and after 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 anti-virus program to locate the problem.

!WARNING!
Disk boot sector is to be modified
Type "Y" to accept write or "N" to abort write
Award Software, Inc.

Enabled:	Activate 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 attempt 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 Enabled.

Enabled:	Enabled cache
Disabled:	Disabled cache

Quick Power On Self Test

This category speeds up Power-On-Self-Test (POST) after you power on the computer. 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 hard disk operation system (i.e., DOS).

A, C, SCSI / C, A, SCSI / C, CDROM, A / CDROM, C, A / D, A, SCSI / E, A, SCSI / SCSI, A, C / SCSI, C, A / C only / LS120, C: System will first search drive for BOOT, and then next other drive, if first driver does not boot.

Swap Floppy Drive

Users can enable this item so that the BIOS will see the hardware "Drive A:" as "Drive B:"" , and hardware "Drive B:"" as "Drive A:"".

Boot Up Floppy Seek

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

Enabled:	BIOS searches for floppy disk drive to determine if it is 40 or 80 tracks. Note that BIOS cannot 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 360KB.

Boot Up NumLock Status: The default value is On.

On:	Keypad is number keys
Off:	Keypad is arrow keys

IDE HDD Block Mode:

This allows your hard disk controller to use the fast block mode to transfer data to and from your hard disk drive (HDD).

Enabled:	IDE controller uses block mode.
Disabled	IDE controller uses standard mode.

Gate A20 Option

The Gate A20 Option default setting is “fast.”. This is the optimum setting for this mainboard.

Typematic Rate Setting

This determines the typematic rate.

Enabled:	Enable typematic rate
Disabled:	Disable typematic rate

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)
It indicates the time between the first and second character displayed when you hold a key.

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.

System:	The system will not boot and access to Setup will be denied if the correct password is not entered at the prompt.
Setup:	The system will boot, but access to Setup will be denied if the correct password is not 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 press* **<Enter>** *to disable security. Once the security is disabled, the system will boot and you can enter Setup freely.*

PCI/ VGA Palette Snoop
It determines whether the MPEG ISA/ VESA VGA cards can work with PCI/ VGA or not.

Enabled:	When PCI/ VGA working with MPEG ISA/ VESA Card.
Disabled:	When PCI/ VGA not working with MPEG ISA/ VESA Card.

OS Select for DRAM>64MB
This item allows you to access the memory that is over 64MB in OS/2.
The default value is 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/DC000-DFFFF Shadow

These categories determine whether optional ROM will be copied to RAM by 16K byte.

Enabled:	Optional shadow is enabled
Disabled:	Optional shadow is disabled

3. Chipset Features Setup

ROM PCI/ISA BIOS (2A6LGTJE)
CHIPSET FEATURES SETUP
AWARD SOFTWARE, INC

Bank 0/1 DRAM Timing	: SDRAM 10ns	Auto Detect DIMM/PCI CLK	: Enabled
Bank 2/3 DRAM Timing	: SDRAM 10ns	Spread Spectrum	: Disabled
Bank 4/5 DRAM Timing	: SDRAM 10ns	CPU Host Clock (CPU/PCI)	: Default
SDRAM Cycle Length	: 3	CPU Warning Temperature	: Disabled
DRAM Clock	: HCLK-33M	Current CPU Temperature	: 54°C/129°F
Memory Hole	: Disabled	Current CPUFAN Speed	: 3529RPM
Read Around Write	: Disabled	Current SYSFAN Speed	: 3529RPM
Concurrent PCI/Host	: Disabled	Current Vcore (V)	: 2.37V
System BIOS Cacheable	: Enabled		
Video RAM Cacheable	: Enabled	Shutdown Temperature	: 60°C/140°F
AGP Aperture Size	: 64M		
AGP-2X Mode	: Enabled	Esc : Quit	↑↓→← : Selection Item
OnChip USB	: Enabled	F1 : Help	PU/PD/+/- : Modify
USB Keyboard Support	: Disabled	F5 : Old Values	(Shift) F2 : Color
Flash BIOS	: Enabled	F6 : Load BIOS Defaults	
		F7 : Load Setup Defaults	

➲ This setup menu is optimized for this mainboard by your computer vendor. Unless you are a qualified engineer and know the item functions you are going to modify, we do not recommend you to change the default setting.

Bank 0/1, 2/3, 4/5 DRAM Timing :
The DRAM timing of Bank 0/1, 2/3, 4/5, 6/7 in this field is set by the system board manufacturer, depending on whether the board has fast paged DRAMs or EDO (extended data output) DRAMs. The Choice: Normal, Medium, Fast, Turbo, FP/EDO 60ns, FP/EDO 70ns.

SDRAM Cycle Length:

This Field sets the CAS latency timing. The Choice: 2, 3.

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

Enabled:	Memory hole supported.
Disabled	Memory hole not supported.

Read Around Write :
DRAM optimization feature: If a memory read is addressed to a location whose latest write is being held in a buffer before being written to memory, the read is satisfied through the buffer contents, and the read is not sent to the

DRAM. The choice: Enabled, Disabled.

Concurrent PCI / Host :
When disable, CPU bus will be occupied during the entire PCI operation period.

The choice: Enabled, Disabled.

System BIOS Cacheable:

Enabled:	Allows caching of the system BIOS ROM at F0000h-FFFFFh, Resulting in better system performance. However, if any program Writes to this memory area, a system error may result.
Disabled:	System BIOS non-Cacheable.

Video RAM Cacheable:
Select Enabled allows caching of the video RAM, resulting in better system prformance. However, if any program writes to this memory area, a system error may result.

The default value is Disabled.

Enabled:	Enabled this function to get better VGA performance; while some brands of VGA must be disabled this function.
Disabled:	Disabled this function.

AGP Aperture Size: The default value is 64 MB.
Select the size of the AGP aperture. The aperture is a portion of the PCI memory address range dedicated for graphics memory address space. Host cycle that hit the aperture range are forwarded to the AGP without any translation. See www.agpforum.org for AGP information. The choice 4, 8, 16, 32, 64, 128, 256.

OnChip USB :
This should be enabled if your system has a USB installed on the system board and you wish to use it. Even when so equipped, if you add a higher performance controller, you will need to disable this feature.

The choice: Enabled, Disabled

USB Keyboard Support :
Select *Enabled* if your system contains a Universal Serial Bus (USB) controller and you have a USB keyboard.

The choice: Enabled, Disabled.

Auto Detect DIMM/ PCI Clk: The default value is Enabled.

Enabled:	The unused DIMM/ PCI slot clock will be disabled.
Disabled:	The unused DIMM/ PCI slot clock will still get the clock signal.

Spread Spectrum: The default value is Disabled.

Enabled:	The clock generator spread spectrum will be Enabled.
Disabled:	The clock generator spread spectrum will be Disabled.

CPU Warning Temperature
When this item is enabled, we can set the CPU warning temperature. If the CPU temperature is higher than the setting temperature, the system will beep.

Current CPU Temperature
It shows the current system temperature.

Current CPUFAN Speed
It shows the running speed of the CPU fan.

It shows the running speed of the system fan.

Current Vin3 (3)
It shows the Vcore valtage.

4. Power Management

ROM PCI / ISA BIOS (2A6LGTJE)
POWER MANAGEMENT SETUP
AWARD SOFTWARE, INC

ACPI function	: Disabled	Primary INTR	: ON
Power Management	: User Define	IRQ3 (COM 2)	: Primary
PM Control by APM	: Yes	IRQ4 (COM 1)	: Primary
Video Off After	: Suspend	IRQ5 (LTP 2)	: Primary
Video Off Method	: V/H SYNC + Blank	IRQ6 (Floppy Disk)	: Primary
MODEM Use IRQ	: 3	IRQ7 (LPT 1)	: Primary
Soft-Off by PWRBTN	: Instant-Off	IRQ8 (RTC Alarm)	: Disabled
HDD Power Down	: Disable	IRQ9 (IRQ2 Redir)	: Secondary
Doze Mode	: Disable	IRQ10 (Reserved)	: Secondary
Suspend Mode	: Disabled	IRQ11 (Reserved)	: Secondary
** PM Events **		IRQ12 (PS/2 Mouse)	: Primary
VGA	: Off	IRQ13 (Coprocessor)	: Primary
LPT & COM	: LPT/COM	IRQ14 (Hard Disk)	: Primary
HDD & FDD	: ON	IRQ15 (Reserved)	: Disabled
DMA/Master	: Off		
Modem Ring Resume	: Disabled	Esc : Quit	↑↓→← : Selection Item
RTC Alarm Resume	: Disabled	F1 : Help	PU/PD/+/- : Modify
		F5 : Old Values	(Shift) F2 : Color
Wake Up On Lan	: Disabled	F6 : Load BIOS Defaults	
		F7 : Load Setup Defaults	

This category determines how much power consumption for system after selecting items mentioned below. Default value is Disabled. The following pages tell you the options of each item and describe the meanings of each option.

ACPI Funtion :

This item allows you to enable/disable the Advanced Configuration and Power Management(ACPI).
The choice: Enabled, Disabled.

Power Management: The default value is Disabled.
Disable: The system operation in NORMAL conditions (Non-GREEN), and the Power Management function is disabled.

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

PM Control by APM: The default value is No.

Yes :	System BIOS will wait for APM's prompt before it enters any PM mode e.g. DOZE, STANDBY or SUSPEND.
No:	System BIOS will ignore APM when power managing the system.

NOTE: If APM is installed, and if there is a task running, even the timer is timeout, the APM will not prompt the BIOS to put the system into any power saving mode!
NOTE: – if APM is not installed, this option has no effect.
To make the APM function work, users have to install power.exe (supported by MS-DOS 5.0 or higher) in Config.exe. To make Windows 3.1 work regularly, in " Windows Setup", users have to set the "Computer" item to " MS-DOS System with APM"

Video Off After :
Selects the power-saving modes during which the monitor goes blank:

Always On	Monitor remains on during power-saving modes.
Suspend --> Off	Monitor blanked when system enters *Suspend* mode.
All Modes --> Off	Monitor blanked when system enters any power saving mode.

Video Off Method: The default value is V/H SYNC+Blank.
Blank Screen: The system BIOS will only blank off the screen when disabling video.
V/H SYNC+Blank: In addition to (1), BIOS will also turn off the V-SYNC & H-SYNC signals form VGA cards to monitor.
DPMS: This function is enabled for only the VGA card supporting DPM.

Soft-Off by PWRBTN : The default value is Instant-Off

When Enabled, turning the system off with the on/off button places the system in a very low-power-usage state, with only enough circuitry receiving power to detect power button activity or Resume by Ring activity.

The Choice: Instant-Off, Delay 4 Sec.

The following four modes are Green PC power saving functions which are only user configurable when *User Defined* Power Management has been selected. See above for available selections.

HDD Power Down : The default value is Disabled

When enabled and after the set time of system inactivity, the hard disk drive will be powered down while all other devices remain active.

Doze Mode
When enabled and after the set time of system inactivity, the CPU clock will run at slower speed while all other devices still operate at full speed.

Suspend Mode: The default value is Disabled
Disabled: System will never enter SUSPEND mode.
10 Sec / 20 Sec / 30 Sec / 40 Sec / 1 Min / 3 Min / 5 Min / 10 Min / 15 Min / 20 Min 30 Min / 40 Min / 1 Hr / 2 Hr / 3 Hr : Defines the continuous idle time before the system
entering SUSPEND mode. If any item defined in (J) is enabled and active, SUSPEND
timer will be reloaded.

PM Events :
PM events are I/O events whose occurrence can prevent the system from entering a power saving mode or can awaken the system from such a mode. In effect, the system remains alert for anything which occurs to a device which is configured as *On*, even when the system is in a power down mode.

VGA :
When set to *On* (default), any event occurring at a VGA port will awaken a system which has been powered down.

LPT & COM :

When set to *On* (default), any event occurring at a COM(serial)/LPT (printer) port will awaken a system which has been powered down.

HDD & FDD :
When set to *On* (default), any event occurring at a hard or floppy drive port will awaken a system which has been powered down.

DMA/Master :

When set to *On*, any event occurring at will awaken a system which has been powered down.

Modem Ring Resume : The default value is Disabled
When set to Enabled, any event occuring to the Modem Ring will awaden a sysstem which has been powered down.
The Choice : Enable, Disable

RTC Alarm Resume :
When Enabled, you can set the date and time at which the RTC (real-time clock) Alarm awakens the system from Suspend mode.
The Choice : Enabled, Disabled.

Primary INTR :
When set to On (default), any even occurring at will awaken a system which has been powered down.

The following is a list of IRQ's, **I**nterrupt **R**e**Q**uests, which can be exempted much as the COM ports and LPT ports above can. When an I/O device wants to gain the attention of the operating system, it signals this by causing an IRQ to occur. When the operating system is ready to respond to the request, it interrupts itself and performs the service.

5. PNP/PCI Configuration Setup

ROM PCI/ISA BIOS (2A6LGTJE) PNP/PCI CONFIGURATION AWARD SOFTWARE, INC.			
PNP OS Installed	: No	CPU to PCI Write Buffer	: Enabled

Resources Contorlled By	: Manual	PCI Dynamic Bursting	: Enabled
Reset Configuration Data	: Enabled	PCI Master 0 WS Write	: Enabled
		PCI Delay Transaction	: Enabled
IRQ-3 assigned to :	: Legacy ISA	PCI#2 Access #1 Retry	: Disabled
IRQ-4 assigned to :	: Legacy ISA	AGP Master 1 WS Write	: Enabled
IRQ-5 assigned to :	: PCI/ISA PnP	AGP Master 1 WS Read	: Disabled
IRQ-7 assigned to :	: PCI/ISA PnP		
IRQ-9 assigned to :	: PCI/ISA PnP		
IRQ-10 assigned to :	: PCI/ISA PnP	Assign IRQ for USB	: Enabled
IRQ-11 assigned to :	: PCI/ISA PnP	Assign IRQ for VGA	: Enabled
IRQ-12 assigned to :	: PCI/ISA PnP		
IRQ-14 assigned to :	: PCI/ISA PnP		
IRQ-15 assigned to :	: PCI/ISA PnP		
DMA-0 assigned to :	: PCI/ISA PnP		
DMA-1 assigned to :	PCI/ISA PnP	ESC: Quit	↑↓→←: Select Item
DMA-3 assigned to :	PCI/ISA PnP	F1 : Help	PU / PD / + / - : Modify
DMA-5 assigned to :	PCI/ISA PnP	F5 : Old Values	(Shift)F2 : Color
DMA-6 assigned to :	PCI/ISA PnP	F6 : Load BIOS Defaults	
DMA-7 assigned to :	PCI/ISA PnP	F7 : Load Setup Defaults	

The following pages tell you the options of each item and describe the meanings of each option.

PNP OS Installed: The default value is No.
Select Yes if the system operating environment is Plug-and-Play aware (e.g., Windows 95).

The Choice: Yes and No.

Resources Controlled By: The default value is Manual.
The Award Plug and Play BIOS can automatically configure all the boot and Plug and Play-compatible devices. If you select Auto, all the interrupt request (IRQ) and DMA assignment fields disappear, as the BIOS automatically assigns them.

The choice: *Auto* and Manual.

Manual: PNP Card‘s resources will be controlled manually. You can set which IRQ-X and DMA-X are assigned to PCI/ISA PNP or Legacy ISA Cards.
Auto: If your ISA card and PCI card are all PNP cards, BIOS will assign the interrupt resources automatically.

Reset Configuration Data: The default value is Disabled.

Normally, you leave this field Disabled. Select Enabled to reset Extended System Configuration Data (ESCD) when you exit Setup if you have installed a new add-on and the system reconfiguration has caused such a serious conflict that the operating system cannot boot.

The choice: *Enabled* and *Disabled*.

CPU to PCI Write Buffer :
When enabled, up to four Dwords of data can be written to the PCI bus without interrupting the CPU. When disabled, a write buffer is not used and the CPU read cycle will not be completed until the PCI bus signals that it is ready to receive the data..

Choices are *Enabled, Disabled*.

PCI Dynamic Bursting :
When *Enabled,* every write transaction goes to the write buffer. Burstable transactions then burst on the PCI bus and nonburstable transactions don't.

Choices are *Enabled, Disabled*.

PCI Master 0 WS Write :
When *Enabled,* writes to the PCI bus are executed with zero wait states.

Choices are *Enabled, Disabled*.

PCI Delay Transaction :
The chipset has an embedded 32-bit posted write buffer to support delay transactions cycles. Select Enabled to support compliance with PCI specification version 2.1.

The choice: Enabled, Disabled.

PCI #2 Access #1 Retry

This item allows you enable/disable the PCI #2 Access #1 Retry.

The choice: Enabled, Disabled.

AGP Master 1 WS Write

This implements a single delay when writing to the AGP Bus. By default, two-wait states are used by the system, allowing for greater stability.

The choice: Enabled, Disabled.

AGP Master 1 WS Read

This implements a single delay when reading to the AGP Bus. By default, two-wait states are used by the system, allowing for greater stability.

The choice: Enabled, Disabled.

Assign IRQ For USB/VGA/ACPI

Name the interrupt request (IRQ) line assigned to the USB/VGA/ACPI (if any) on your system. Activity of the selected IRQ always awakens the system.

5. Load BIOS Default

When you access "Load BIOS Default", the following message appears:

Load BIOS Default (Y/N) ?N

The BIOS Default values are the "worst case" default, and are the most stable values for the system. Use them if the system is performing erratically due to hardware problems. To load the Setup Default values, press <Y> then <Enter>.

6. Load Setup Default

When you access "Load Setup Default", you are shown the following message:

Load Setup Default (Y/N) ?N

The Setup Default values represent the "best case" default, and should provide optimum system performance. To load the BIOS Default values, press <Y> then <Enter>.

7. Integrated Peripherals Setup

ROM PC/ISA BIOS (2A6LGTJE)
INTEGRATED PERIPHERALS
AWARD SOFTWARE, INC.

OnChip IDE Channel 0		: Enabled	UART Moe Select	: Normal
OnChip IDE Channel 1		: Enabled		
IDE Prefetch Mode		: Enabled		
Primary Master	PIO	: AUTO		
Primary Slave	PIO	: AUTO		
Secondary Master	PIO	: AUTO	Onboard Parallel Port	: 378 / IRQ7
Secondary Slave	PIO	: AUTO	Parallel Port Mode	: ECP+EPP
Primary Master	UDMA	: AUTO	ECP Mode Use DMA	: 3
Primary Slave	UDMA	: AUTO	EPP Mode Select	: EPP1.7
Secondary Master	UDMA	: AUTO		
Secondary Slave	UDMA	: AUTO		
Init Display First		: AGP		
POWER ON Function		: Hot KEY		
Hot Key Power On		: Ctrl-F12		
KBC input clock		: 8 MHz	Esc : Quit ↑↓→Selection	:Item
Onboard FDC Controller		: Enabled	F1 : Help PU/PD/+/- :	Modify
Onboard Serial Port 1		: 3F8/IRQ4	F5 : Old Values (Shift)F2 :	Color
Onboard Serial Port 2		: 2F8/IRQ3	F6 : Load BIOS Default F7 : Load Setup Default	

➲ This setup menu is optimized for this mainboard by your computer vendor. Unless you are a qualified engineer and know the item functions you are going to modify, we do not recommend you to change the default setting.

OnChip IDE Channel 0 :

The chipset contains a PCI IDE interface with support for two IDE channels. Select *Enabled* to activate the first and/or second IDE interface. Select *Disabled* to deactivate an interface, if you install a

primary and/or secondary add-in IDE interface. The choice: Enabled, Disabled.

OnChip IDE Channel 1 :
The onboard IDE drive interfaces supports IDE prefetching, for faster drive accesses. If you install a primary and/or secondary add-in IDE interface, set this field to *Disabled* if the interface does not support prefetching.

The choice: Enabled, Disabled.

IDE Prefetch Mode :
The onboard IDE drive interfaces supports IDE prefetching, for faster drive accesses. If you install a primary and/or secondary add-in IDE interface, set this field to *Disabled* if the interface does not support prefetching.

IDE Primary/Secondary Master/Slave PIO

The four IDE PIO (Programmed Input/Output) fields let you set a PIO mode (0-4) for each of the four IDE devices that the onboard IDE interface supports. Modes 0 through 4 provide successively increased performance. In Auto mode, the system automatically determines the best mode for each device.

IDE Primary/Secondary Master/Slave UDMA

Ultra ATA/66 implementation is possible only if your IDE hard drive supports it and the operating environment includes a DMA driver (Windows 95 OSR2 or a third-party IDE bus master driver). If your hard drive and your system software both support Ultra ATA/66, select Auto to enable BIOS support.

The Choice: Auto, Disabled

Init Display First

This item allows you to decide to active PCI Slot or AGP first
The choice: PCI Slot, AGP.

Onboard FDC Controller : The default value is Enabled

Enabled :	Enable the Onboard floppy driver interface controller.
Disabled:	Disable the Onboard floppy driver interface controller when use On-Card card ISA FDC's controller.

Onboard Serial Port 1 : The default value is 3F8 / IRQ4.

COM 1:	Enable Onboard Serial port 1 and address is 3F8 / IRQ4
COM 2:	Enable Onboard Serial port 1 and address is 2F8 / IRQ3

Onboard Serial Port 2 : The default value is 2F8 / IRQ3.

COM 1:	Enable Onboard Serial port 2 and address is 3F8 / IRQ4
COM 2:	Enable Onboard Serial port 2 and address is 2F8 / IRQ3

UART Mode Select:
This item allows you to determine which Infra Red (IR) function of onboard I/O chip. The Choice: Standard, ASKIR, HPSIR.

Onboard Parallel port 2: The default value is 378H / IRQ 7.

378H:	Enable Onboard LPT port and address is 378H and IRQ 7.
278H:	Enable Onboard LPT port and address is 278H and IRQ 5.
3BCH:	Enable Onboard LPT port and address is 3BCH and IRQ 7.
Disabled:	Disabled Onboard LPT port.

NOTE: Parallel Port address is 378H / 3BCH that selects routing of IRQ 7 for LPT1. Parallel Port address is 278H that selects the routing of IRQ 5 for LPT 1.

Parallel port Mode: This field allows the user to select the parallel port mode. The default value is Standard mode.

SPP:	Standard mode. IBM PC / AT Compatible bidirectional parallel port.
EPP:	Enhanced Parallel Port mode.
ECP:	Extended Capabilities Port mode.
EPP+ECP:	ECP Mode and EPP Mode.

ECP Mode USE DMA: This field allows the user to select DMA 1 or DMA 3 for the ECP mode. The default value is DMA 3.

DMA 1:	The field selects the routing of DMA 1 for the ECP mode.
DMA 3:	The field selects the routing of DMA 3 for the ECP mode.

EPP Mode Select : The default value is EPP1.7

EPP 1.7:	The field selects the routing of EPP1.7 for the EPP mode.
EPP 1.9:	The field selects the routing of EPP1.9 for the EPP mode.

8. Supervisor\User Password

When you select this function, the following message will appear at the center of the screen to assist you in creating a password.

ENTER PASSWORD

Type the password, up to eight characters, and press <Enter>. The password typed now will clear any previously entered password from CMOS memory. You will be asked to confirm the password. Type the password again and press <Enter>. You may also press <Esc> to abort the selection and not enter a password.
If you select System at Security Option of BIOS Features Setup Menu, you will be prompted for the password everytime the system is rebooted or anytime you try to enterSetup. If you select Setup at Security Option of BIOS Features Setup Menu, you will be prompted only when you try to enter Setup.

9. IDE HDD Auto Detection

This feature allows you to check all the information on your hard disk formation. When you access "IDE HDD Auto Detection", the system executes auto detection. At the prompt, it represents all the information on your HDD, and you are asked:

Do you accept this drive C: (Y/N) ?

1. If you accept the test result, press [Y] then [Enter] and the result is saved, then the system continues to detect another HDD.
2. If not, press [N] then [enter] and the system continues to detect another HDD.

10. Hard Disk Low Level Format Utility

This Award Low-Level-Format Utility is designed as a tool to save your time formatting your hard disk. The Utility automatically looks for the necessary information of the drive you select. The Utility also searches for bad tracks and lists them for your reference.
Shown below is the Main Menu after you enter into the Award Low-Level-Format Utility.

Control Keys
Use the Up and Down arrow keys to move around the selections displayed on the upper screen. Press [Enter] to accept the selection. Press Esc to abort the selection or exit the Utility.

SELECT DRIVE
Select from installed hard disk drive C or D. List at the bottom of the screen is the drive automatically detected by the utility.

BAD TRACK LIST
Auto scan bad track
The utility will automatically scan bad tracks and list the bad tracks in the window at the right side of the screen.

Add bad track
Directly type in the information of the known bad tracks in the window at the right side of the screen.

Modify bad track
Modify the information of the added bad tracks in the window at the right side of the screen.

Delete bad track
Delete the added bad tracks in the window at the right side of the screen.

Clear bad track table
Clear the whole bad track list in the window at the right side of the screen.

PREFORMAT
Interleave
Select the interleave number of the hard disk drive you wish to perform low level format. You may select from 1 to 8. Check the documentation that came with the drive for the correct interleave number, or select 0 for utility automatic detection.

Auto scan bad track
This allows the utility to scan first then format by each track.

Start
Press <Y> to start low level format.

11. Exiting the Setup Program

To exit the Setup program, do the following:
If you want to save your change:
a. At the Main menu, select "Save & Exit Setup", then press [Enter]
b. Press [Y] then [Enter] to confirm. The system will boot with your new BIOS setting in effect .
If you want to abandon your changes:
a. At the Main Menu, select "Exit Without Saving", then press [Enter].
b. Press [Y] then [Enter] to confirm. The system will reboot with the original BIOS setting in effect.

Technical information

A. I/O Connector Map

Floppy Disk Connector

Ground	1	2	FDHDIN	
Ground	3	4	Reserved	
Ground	5	6	FDEDIN	
Ground	7	8	-Index	
Ground	9	10	Motor Enable	
Ground	11	12	-Driver selectB	
Ground	13	14	-Driver selectA	
Ground	15	16	Motor Enable	
Ground	17	18	-DIR	
Ground	19	20	-STEP	
Ground	21	22	Write Data	
Ground	23	24	Write Gate	
Ground	25	26	-Track 00	
Ground	27	28	-Write Protect	
Ground	29	30	-Read Data	
Ground	31	32	-Side 1 select	
Ground	33	34	Diskette	

IDE Connector

Reset IDE	1	2	Ground	
HOST Data 7	3	4	HOST Data 8	
HOST Data 6	5	6	HOST Data 9	
HOST Data 5	7	8	HOST Data10	
HOST Data 4	9	10	HOST Data11	
HOST Data 3	11	12	HOST Data12	
HOST Data 2	13	14	HOST Data13	
HOST Data 1	15	16	HOST Data14	
HOST Data 0	17	18	HOST Data15	
Grund	19	20	Key	
DRQ 3	21	22	Ground	
-I/O Write	23	24	Ground	
-I/O Read	25	26	Ground	
IOCHRDY	27	28	BALE	
-DACK 3	29	30	Ground	
IRQ 14	31	32	-IOCS16	
Addr 1	33	34	Ground	
Addr 2	35	36	Addr2	
-Chip select	37	38	-Chip select 1	
Activity	39	40	Ground	

ISA Bus

GND	1	1	-I/OCH CHK
RESET	2	2	SD 07
+5V	3	3	SD 06
IRQ 9	4	4	SD 05
-5V	5	5	SD 04
DRQ2	6	6	SD 03
-12V	7	7	SD 02
OWS	8	8	SD 01
+12V	9	9	SD 00
GND	10	10	-I/O CH RDY
-SMEMW	11	11	AEN
-SMEMR	12	12	SA 19
-IOW	13	13	SA 18
-IOR	14	14	SA 17
-DACK3	15	15	SA 16
-DRQ3	16	16	SA 15
-DACK1	17	17	SA 14
-DRQ1	18	18	SA 13
-REFRESH	19	19	SA 12
BCLK	20	20	SA 11
IRQ 7	21	21	SA 10
IRQ 6	22	22	SA 09
IRQ 5	23	23	SA 08
IRQ 4	24	24	SA 07
IRQ 3	25	25	SA 06
-DACK2	26	26	SA 05
T/C	27	27	SA 04
BALE	28	28	SA 03
+5V	29	29	SA 02
OSC	30	30	SA 01
GND	31	31	SA 00
-MEMCS 16	1	1	SBHE
-I/OCS16	2	2	LA 23
IRQ 10	3	3	LA 22
IRQ 11	4	4	LA 21
IRQ 12	5	5	LA 20
IRQ 15	6	6	LA 19
IRQ 14	7	7	LA 18
-DACK 0	8	8	LA 17
DRQ 0	9	9	-MEMR
-DACK 5	10	10	-MEMW
DRQ 5	11	11	SD 08
-DACK 6	12	12	SD 09
DRQ 6	13	13	SD 10
-DACK 7	14	14	SD 11
DRQ 7	15	15	SD 12
+5V	16	16	SD 13
-MASTER	17	17	SD 14
GND	18	18	SD 15

ATX POWER SUPPLY Connector

3.3 V	11	1	3.3 V	
-12 V	12	2	3.3 V	
GND	13	3	GND	
PS-ON	14	4	5 V	
GND	15	5	GND	
GND	16	6	5 V	
GND	17	7	GND	
-5 V	18	8	PW-OK	
5 V	19	9	5 V-SB	
5 V	20	10	12 V	

Serial port connector

		1	DCD	
DSR	6	2	SIN	
RTS	7	3	SOUT	
CTS	8	4	DTR	
RI	9	5	GND	

Parallel port connector

-STROBE	1	14	-AUTO FEED
Data Bit 0	2	15	-ERROR
Data Bit 1	3	16	-INIT
Data Bit 2	4	17	-SLCT IN
Data Bit 3	5	18	Ground
Data Bit 4	6	19	Ground
Data Bit 5	7	20	Ground
Data Bit 6	8	21	Ground
Data Bit 7	9	22	Ground
-ACJ	10	23	Ground
BUSY	11	24	Ground
PE	12	25	Ground
SLCT	13		

PS/2 mouse connector signal line

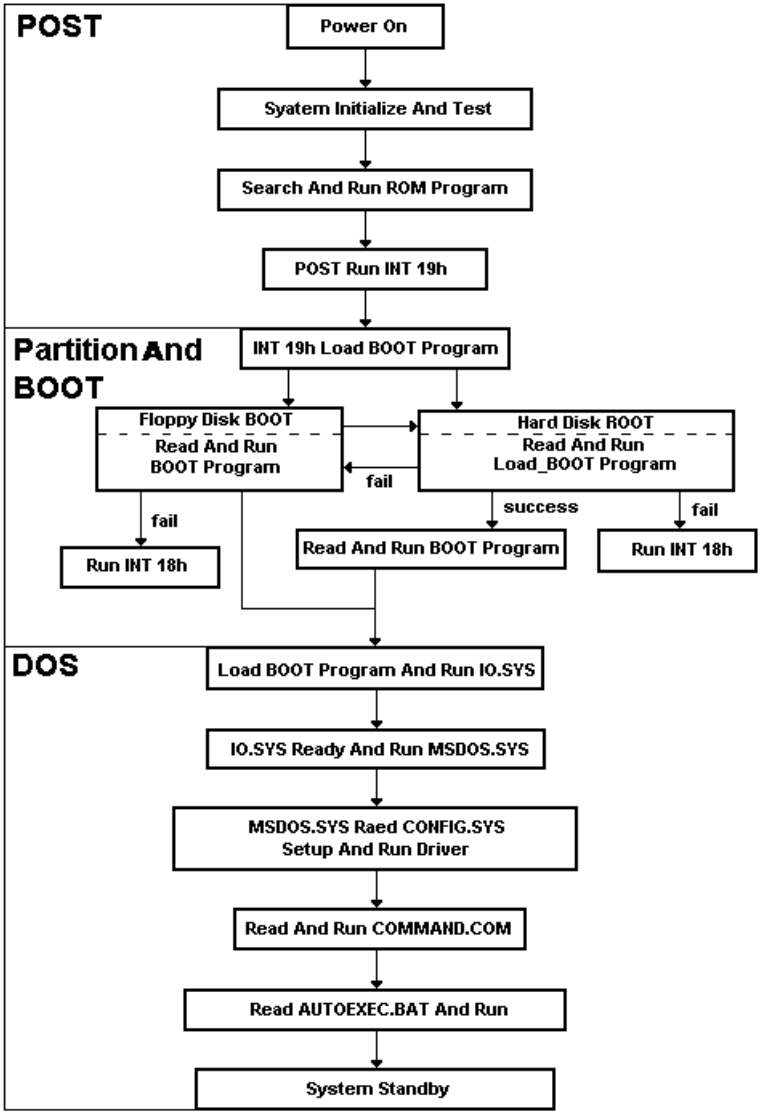
Data(Red)	1	4	NC
Clock(Blue)	2	5	VCC(Yellow)
GND(Green)	3		

B. The transfer rate of IDE PIO and DMA modes.

Mode	PCI Bus Clock	Cycle time	Data transfer rate
PIO Mode 0	33 MHz	600 ns	3.3 MB/s
PIO Mode 1	33 MHz	383 ns	5.2 MB/s
PIO Mode 2	33 MHz	240 ns	8.3 MB/s
PIO Mode 3	33 MHz	180 ns	11.1 MB/s
PIO Mode 4	33 MHz	120 ns	16.6 MB/s
PIO Mode 5	33 MHz	90 ns	20 MB/s
DMA Mode 0	33 MHz	480 ns	4.16 MB/s
DMA Mode 1	33 MHz	150 ns	13.3 MB/s
DMA Mode 2	33 MHz	120 ns	16.6 MB/s
DMA/33	33 MHz	60 ns	33 MB/s

When IORDY signal is used, PIO Mode 3/4 is in ATA-2 format while PIO Mode 0/1/2 is in ATA format. PIO Mode5 is unlikely to happen.

C. The Computer BOOT flow. chart



D. The difference of Chipsets

	INTEL 440 BX	INTEL i810e	VIA 693A+596B
CPU support	Pentium II / III	Pentium II / III	Pentium II / III
Memory size	1GB	1GB	1 GB
Memory	SDRAM	SDRAM	SDRAM
Memory Clock	100	100	100/133MHz
Ex. Clock	66/100MHz	66/100/133MHz	66/100/133 MHz
ACPI	Yes	Yes	ACPI
AGP Bus	X 2	X 2	X 4
Ultra ATA/66	No	Yes	Yes

- **Ultra ATA/66**

  It's an extension of Ultra ATA33 interface. This new high-speed interface has doubled the Ultra ATA/33 burst data transfer rate to 66.6 Mbytes/sec and maximized disk performance under current PCI local bus environment.

- **ACPI (Advanced Configuration and Power Interface)**

  This Advanced Configuration and Power Interface set up by Intel, Microsoft, Compaq, IBM, HP….etc, offers the functions below:

  (1) . Automatically stops offering power to CD-ROM, FDD or HDD when any of them is not in use.

  (2) . Offers the "OnNow" function; when you start the system, what is seen on the screen is in the condition same as the last time before the system was shut down.

  (3) . Enhances the system configuration like PnP, DMI….

- **USB(Univer Serial Bus)**

  The new Bus specification defined by Compaq, DEC, IBM, Microsoft, NEC, Intel ….etc, is connected by USB, making it possible for the peripheral to have the "plug and play" function

without interface card. There are at most 127 peripherals that can be connected at the same time.

- **Printer Modes /SPP /ECP /EPP**

  SPP (Standard Parallel Port)
  The current commonly used standard mode.

  ECP (Extended Capabilities Port)
  Jointly set by Microsoft and HP. Its main feature is using high-performance half-duplex bi-directional channel to achieve faster transmission speed. Its 16-bit FIFO (First-In-First-Out) buffer makes high-speed transmission more stable and reliable. DMA function is included in its controller.

  EPP (Enhanced Parallel Port)
  Jointly set by Intel, Zenith and Xircom. Bi-directional block transmission makes transmission speed to reach 2MB per second. It is compatible with the standard parallel port interface. For printers that do not support the EPP mode in Windows 95, including the Canon BJ Series and the Epson LQ Series, you can set the Parallel Mode in BIOS to Normal (SPP) Mode to enable EPP.

- I**rDA (Infrared Data Association)**

  This organization sets the infrared transmission standards. The IrDA Protocol sets transmission speed at 115KB per second and a transmission angle of 30 degree. Its Serial Port shall have 16550 UARTs and its maximum transmission distance is one meter.

- **S. M. A. R. T (Self Monitoring Analysis Report Technology)**

It is jointly set by Conner, IBM, Quantum, Seagate and Western Digital.

Most hard disks on the market have this function. It issues a warning

message to the computer user prior to the "actual" failure of the user can

have sufficient time to backup data or to replace the hard disk.

E. TIME and 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	Audio.
	DMA Channel 2	FLOPPY DISK.
	DMA Channel 3	Onboard ECP (default).
	DMA Channel 4	Cascade.
	DMA Channel 5	PCMCIA DMA.
	DMA Channel 6	MPEG.
	DMA Channel 7	Available.

F. INTERRUPT MAP

NMI: Parity check error.

IRQ (H/W):

0 System TIMER interrupt form TIMER 0.
1 KEYBOARD output buffer full.
2 Cascade for IRQ 8-15.
3 SERIAL port 2.
4 SERIAL port 1.
5 Audio/MPU-401 or PARALLEL port 2.
6 FLOPPY DISK.
7 PARALLEL port 1.
8 RTC clock.
9 Available.

10 PCMCIA.
11 MPEG.
12 Trackpad (PS/2 Mouse).
13 MATH coprocessor.
14 Primary IDE interface (HDD).
15 Secondary IDE interrface (CD-ROM).

G. RTC and CMOS RAM MAP

RTC and CMOS:	00	Seconds
	01	Seconds alarm
	02	Minutes
	03	Minutes alarm
	04	Hours
	05	Hours alarm
	06	Day of week
	07	Day of month
	08	Month
	09	Year
	0A	Status register A
	0B	Status register B
	0C	Status register C
	0D	Status register D
	0E	Diagnostic status byte
	0F	Shutdown byte
	10	FLOPPY DISK drive type byte
	11	Reserve
	12	HARD DISK type byte
	13	Reserve
	14	Equipment type
	15	Base memory low byte
	16	Base memory high byte
	17	Extension memory low byte
	18	Extension memory high byte
	19-2d	
	2E-2F	
	30	Reserved for extension memory low byte

31	Reserved for extension memory high byte
32	DATE CENTURY byte
33	INFORMATION FLAG
35-3F	Reserve
40-7F	Reserved for CHIPSET SETTING DATA

A. POST Code

POST (HEX)	Description
C0	1. Turn off OEM specific cache, shadow... 2. Initialize all the standard devices with default values standard devices including: - DMA controller (8237) - Programmable Interrupt Controller (8259) - Programmable Interval Timer (8254)
C1/C6	Auto-detection of onboard DRAM and Cache
C3	1. Test the first 256K DRAM 2. Expand the compressed codes into temporary DRAM area including the compressed System BIOS and Option ROMs
C5	Copy the BIOS from ROM into E0000-FFFFF shadow RAM so that POST will go faster
01-02	Reserved
03	Initialize EISA registers (EISA BIOS ONLY)
04	Reserved
05	1. Keyboard Controller Self-Test 2. Enable Keyboard Interface
06	F000 shadow R/W test
07	Verifies CMOS‘s basfic R/W functionality
BE	Program defaults values into chipset according to the MODBINable Chipset Default Table
09	1. Issue CPU ID instruction to idedtify CPU type 2. Program the configuration register of Cyrix CPU according to the MODBINable Cyrix Register Table 3. OEM specific cache initialization
0A	1. Initialize the first 32 interrupt vectors with correspoinding interrupt handlers Initialize INT no from 33-120 with Dummy (Spurious) Interrupt Handler 2. Early Power Management initialization (OEM specific)
0B	1. Verify whether RTC time is valid or not 2. Detect bad battery 3. Read CMOS data into BIOS stack area 4. PNP initializations including (PNP BIOS ONLY) - Assign CSN to PNP ISA card - Create resource map from ESCD 5. Update the P6 CPU‘s micro code (P6 Only) 6. Assign IO and Memory for PCI devices (PCI BIOS ONLY)

POST (HEX)	Description
0C	Initialization of the BIOS Data Area (40:0-40:FF)
0D	1. P5 Multi-P BIOS Only Init IO and Local APIC 2. Program some of the Chipset‘s value according to Setup (Early Setup Value Program) 3. Measure CPU speed for display and decide system clock speed 4. Video initialization including Monochrome, CGA, EGA/VGA. If no display device found, the speaker will beep
0E	1. Initialize the APIC (Multi-Processor BIOS ONLY) 2. Test video RAM (If Monochrome display device found) 3. Show messages including: - Award Logo, Copyright String, BIOS Date code and Part No. - OEM specific sign on messages - Energy Star Logo (Green BIOS Only) - CPU brand, type and speed
0F	DMA channel 0 test
10	DMA channel 1 test
11	DMA page registers test
12-13	Reserved
14	Test 8254 Timer 0 Counter 2
15	Test 8259 interrupt mask bits for channel 1
16	Test 8259 interrupt mask bits for channel 2
17	Reserved
19	Test 8259 functionality
1A-1D	Reserved
1E	If EISA NVM checksum is good,, execute EISA initialization
1F-29	Reserved
30	1. Get Base Memory and Extended Memory Size 2. P6 Multi-P BIOS Only Init IO & Local APIC 3. Program K5 CPU‘s Write Allocation
31	1. Get Base Memory and Extended Memory Size 2. P6 Multi-P BIOS Only Init IO and Local APIC 3. Program K5 CPU‘s Write Allocation
32	1. Display the Award Plug and Play BIOS Extension message (PNP BIOS ONLY) 2. Program all onboard super I/O chips (if any) including COM ports, LPT ports, FDD port... according to setup value 3. Program onboard audio devices

POST (HEX)	Description
33-3B	Reserved
3C	Set flag to allow users to enter CMOS Setup Utility
3D	1. Initialize Keyboard 2. Install PS/2 mouse 3. Build the INT 15h function E820H table 4. Build the PnP Device Node for total memory size
3E	Try to turn on Level 2 cache Note: Some chipset may need to turn on the L2 cache in this stage. But usually, the cache is turned on later in POST 61h
3F-40	Reserved
BF	1. Program the rest of the Chipset's value according to setup 2. If auto-configuration is enabled, program the chipset with predefined values in the MODBIN able Auto-Table
41	Initialize floppy disk drive controller
42	1. Cut IRQ 12 connection if PS/2 mouse is not installed 2. Install IDE Hard Drives - Auto-detect HDDs - Build the AT compatible HDD table for Type 47 - Set PIO timing 3. Detect CD ROM on IDE Bus 4. Detect LS120 drive
43	If it is a PNP BIOS, initialize serial and parallel ports
44	Reserved
45	Initialize math coprocessor
46-4D	Reserved
4E	1. If there is any error detected (such as video, kb.....), show all the error messages on the screen and wait for the user to 2. Enable “Far Hit” for Cyrix 6x86 CPU
4F	1. If password is needed, ask for password 2. Clear the Energy Star Logo (Green BIOS ONLY)
50	Write all the CMOS values currently in the BIOS stack area Back into the CMOS
51	Reserved

POST (HEX)	Description
52	1. Initialize all ISA ROMs 2. Later PCI initializations (PCI BIOS ONLY) - assign IRQ to PCI devices - initialize all PCI ROMs 3. Program shadows RAM according to setup settings 4. Program Parity according to Setup setting 5. Power Management Initialization - Enable/Disable global PM - APM interface initializtion
53	1. If it is NOT a PNP BIOS, initialize serial and parallel port 2. Initialize time value in BIOS data area by translating the RTC time value into a timer tick value
54-5F	Reserved
60	Setup Virus Protection (Boot Sector Protection) functionality According to setup setting
61	1. Try to turn on Level 2 cache Note: if L2 cache is already turned on in POST 3D, this part will be skipped 2. Set the boot up speed according to setup setting 3. Last chance for chipset initialization 4. Last chance for power Management initialization (Green BIOS only) 5. Show the system configuration table
62	1. Setup daylight saving according to setup value 2. Program the NUM Lock, typmatic rate and typmatic speed according to setup setting
63	1. If there is any changes in the hardware configuration, update the ESCD information (PNP BIOS ONLY) 2. If there is any changes in the hardware configuration, update the DMI data pool (DMI BIOS ONLY) 3. Clear memory that have been used 4. Boot system via INT 19h
FF	System Booting. This means that the BIOS already pass the control right to the operating system

Utility Guide

AWDFLASH

It's for you to erase the system BIOS that is stored on the system mainboard and let you write a updated BIOS into the BIOS. If you erase current BIOS but not write in a new BIOS successfully, the system will malfunction.

You can only use this AWDFLASH.EXE in real-mode DOS (not the DOS box under Windows95/98/NT). So, you need to shut down your computer and select Restart from DOS. If you are just under Windows 95/98/NT, shut down your computer and boot via a DOS diskette for running this utility.

VIA IDE Master Driver

This PCI driver is for installation only in Windows 95/98. The latest Version is V2.13. You may able to get more up-to-date driver from the Web Site of VIA Technology Inc. WWW.VIA.COM.TW

VIA AGP Bus Master Driver

This PCI driver is for installation only in Windows 95/98. The latest Version is V3.0. This VIA AGP driver need to be installed before you install an AGP driver. You may able to get more up-to-date driver from the Web Site of VIA Technology Inc. WWW.VIA.COM.TW

VIA Sound Driver

This driver is for installation in Windows 95/98/NT. You may able to get more up-to-date driver from the Web Site of VIA Technology Inc. WWW.VIA.COM.TW

Super-VB

This anti-virus software is provided by Paragon and is able to be installed for Windows95/98 and DOS. Just run Set-Up file for it.

Smart-Debug

This file includes System Monitoring and System Debug utility. After installation, you can use both function. Aside from System Monitoring and System Debug, CPU temperature will be always standing on the debug display for internal and external after debugging.