

NT928 P2BXD
ISA/PCI Mainboard

with onboard PCI IDE and super Multi-I/O.

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Overview

The NT928 P2BXD is a Pentium II based mainboard that utilizes Intel's newest 82440BX chipset with in an ATX size. This mainboard is designed for both Pentium II and Celeron CPU's It supports new architectures such as high speed AGP graphic port, Ultra DMA/ 33, Bus Master IDE, SDRAM memory and is expandable to a maximum of 1Gbyte of memory.

In addition to above features, NT928 P2BXD implements most advanced technology such as synchronous Switching voltage regulator, **CPU thermal protection, CPU fan monitoring, System voltage monitoring, Over current protection, Modem Wake Up, Keyboard power on, PS/2 mouse power on, Debug sensor LED on board and user-friendly jumper-less CPU speed selection.**

The most unique feature of the NT928 P2BXD is its capability to debug possible installation and peripherals faults onboard. When the CPU, DRAM, FDD, or VGA cards have not been properly installed, a DIY user can isolate problems through reading the Debug Sensor LED and instructions in the manual. To professional system test engineers or maintenance engineers, the Debug Sensor works as a Port 80 Debug Card for testing and maintenance in lieu of the 80 Port Debug card.

Main Features

1. Debug sensor LED display on board.
2. Supports the newest specifications of ACPI.
3. Supports Ultra DMA/33-highest rate IDE transfer speed
4. Supports current CPUs at 66 or 100MHZ clock and future higher speed CPUs that are compatible with SEC Socket.
5. Support IR/Consumer IR/USB and PS/2 devices.
6. Supports modem ring on.
7. Compatible with PCI 2.1 Spec.
8. With the "power saving" feature, the CPU cooler automatically stops when the system enters the green mode state.
9. CPU cooling fan connector built in.
10. System fan connector built-in.
11. Supports Intel LDCM Network Manageability.
12. Supports ECC or Non-ECC type SDRAM modules.
13. Supports Keyboard Power On.
14. Supports PS/2 Mouse Power On.
15. **Supports BIOS in setting CPU type.**
16. **Supports automatic closing of the unused DIMM/ PCI clock to reduce noise.**

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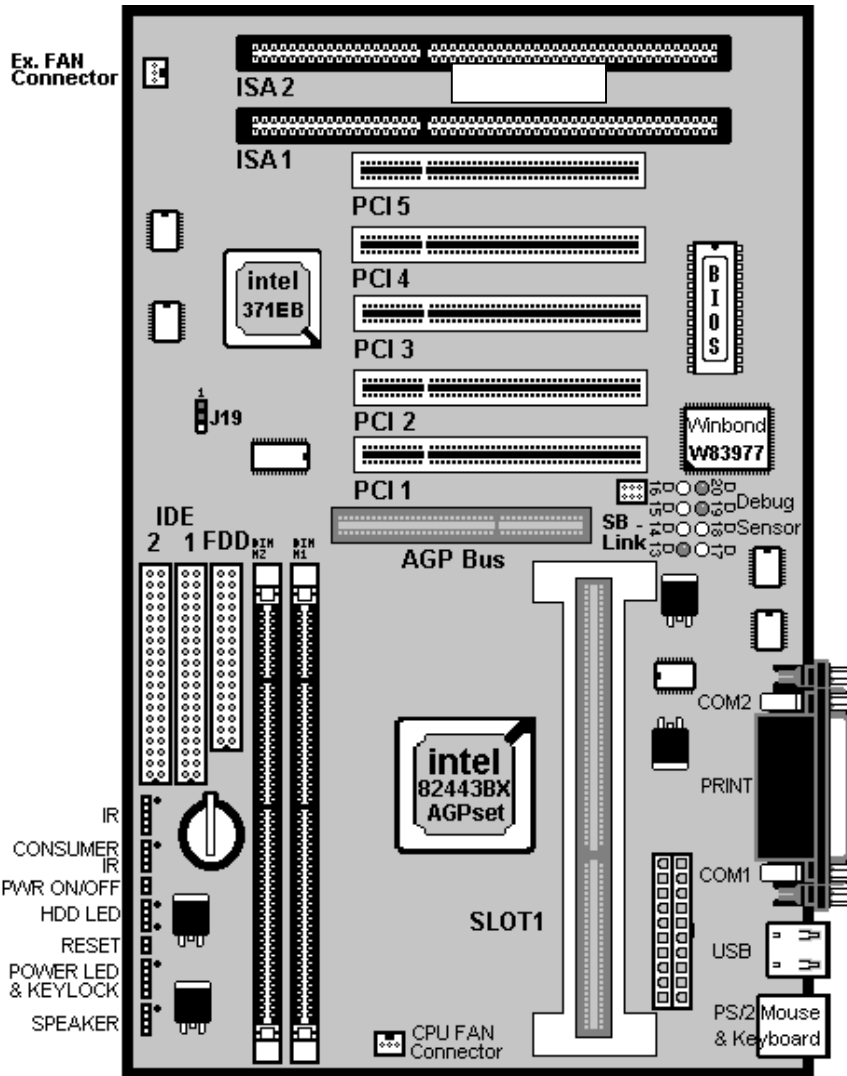
Introduction

A. Specifications

System Chipset	Intel 82440 BX chipset.
CPU	Intel Pentium II processors, support 233/266/300/333 MHz (External Clock 66MHz) . 300/350/400/ 450/ 500 MHz (Ext Clock 100MHz).
Memory	Expandable to 768MB (3 banks) with three 168-pin DIMM sockets {support 3.3 V EDO (66MHz only) / SDRAM (66MHz/ 100MHz)}.
I/O	Winbond 83977, 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 Supports 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, five PCI Master Slots and two 16-bit ISA Slots.
Voltage	Auto 1.8V-3.5V
Dimension	4-layer PCB, size (300mm x 190mm).
Others	CPU speed selection in BIOS (Jumper-less), CPU Auto Temperature Sensor & Music Alarm, voltage monitor, CPU Fan and System Fan monitor, Bus Master/ Ultra DMA/33, ACPI, AGP Bus, Keyboard Power On, PS/2 Mouse Power On, Modem Ring On, Lan wake up, Debug sensor on board.

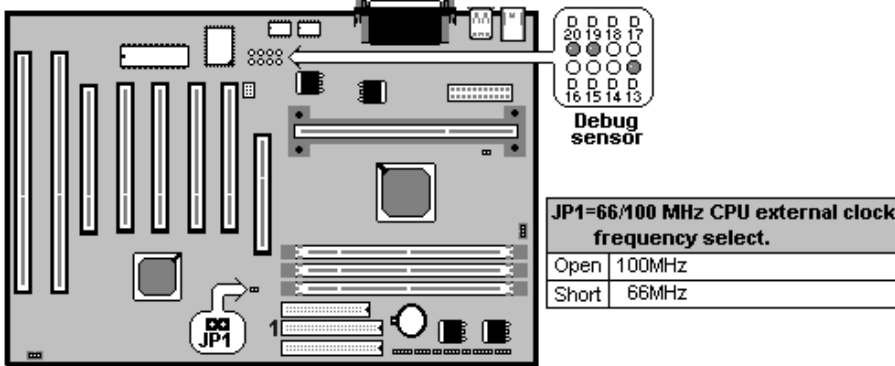
Setup Guide

A. Layout Diagram



B. Smart Debug On Board

When the CPU module, DRAM, Cache RAM, FDD or VGA cards have not been properly installed, users can isolate those basic problems through the Debug Sensor LED and instructions from the manual. For professional system engineers or maintenance engineers, the Debug Sensor works in the same fashion as a Port 80 Debug Sensor Card.



NOTE: This is an example of functionality. For detail, see technical section.

Error code	Display	Message	Solution	
D20 ● ● ● ● ● D17 D16 ○ ○ ○ ○ ○ D13	C1	None	Can't detect DRAM	1. Re-install or replace the SDRAM. 2. Re-install or replace the BIOS.
D20 ● ● ● ● ● D17 D16 ● ● ● ● ● D13	C6	None	Can't detect DRAM	1. Re-install or replace the SDRAM. 2. Re-install or replace the BIOS.
D20 ○ ○ ○ ○ ○ D17 D16 ● ● ● ● ● D13	OD	None	Can't detect VGA card	1. Re-install or replace the VGA card. 2. Replace the BIOS.
D20 ○ ● ● ● ● D17 D16 ● ● ● ● ● D13	4E	Yes	Can't detect Floppy disk	1. Replace the BIOS. (if no screen) 2. Enter the BIOS Setup menu to reset. 3. Check that the FDD cable and the power connector are properly connected. 4. Reconnect the FDD cable or replace the FDD.
D20 ○ ● ● ● ● D17 D16 ○ ○ ○ ○ ○ D13	61	Yes	L2 cache problem	1. Enter BIOS Setup to disable the external cache.

C. CPU Voltage and Frequencies

Before starting, set one jumper, JP1 for external (66/100) clock selection. The ratio and frequency of the CPU is set up in the BIOS. The corresponding working voltage for the CPU is automatically detected and set.

Please read carefully the following instructions:

1. Power on the installed system and press the "DEL" key to enter BIOS Setup.

ROM PCI/ISA BIOS (2A69KTJ9)			
CHIPSET FEATURE SETUP			
AWARD SOFTWARE, INC			
Auto Configuration	: Enabled	Auto Detect DIMM/ PCI Clk	: Enabled
EDO DRAM Speed Selection	: 60ns	CPU Speed	: Manual
EDO CAS# MA Wait State	: 2	CPU Ratio	: X 2.5
EDO RAS# Wait State	: 2	CPU Frequency	: 100 MHz
SDRAM RAS-to CAS Delay	: 3	Spread Spectrum	: Disabled
SDRAM RAS Precharge Time	: 3	CPU Warning Temperature	: Disabled
SDRAM CAS latency Time	: Auto	Current CPU Temperature	: 28•/ 82•
DRAM Data Integrity Mode	: Non-ECC	Current SYSFAN Speed	:4285 RPM
System BIOS Cacheable	: Enabled	Current CPUFAN Speed	:4000 RPM
Video BIOS Cacheable	: Enabled	Current Vin3 (V)	: 2.88V
Video RAM Cacheable	: Disabled		
8 Bit I/O Recovery Time	: 1		
16 Bit I/O Recovery Time	: 1		
Memory Hole At 15M-16M	: Disabled		
Passive Release	: Enabled	Esc : Quit	↑↓→← Selection : Item
Delayed Transaction	: Disabled	F1 : Help	PU/PD/+/- :
		Modify	
AGP Aperture Size (MB)	: 64	F5 : Old Values	(Shift) F2 :
		Color	
		F6 : Load BIOS Default	
		F7 : Load Setup Default	

Select "Chipset Features Setup" and press <Enter>.

2. Select "CPU Speed" and press "PgUp" or "PgDn" to set the CPU ratio and frequency. The available options are:

233MHz (66X3.5), 266MHz (66X4), 300MHz (66X4.5), 333MHz (66X5), 366MHz (66X5.5), 400MHz(66X6), 433MHz(66X6.5), 466MHz(66X7), 500MHz(66X7.5).
 250MHz(100X2.5), 300MHz(100X3), 350MHz(100X3.5), 400MHz(100X4), 450MHz(100X4.5), 500MHz(100X5), 550MHz(100X5.5), 600MHz(100X6) and "Manual".

Technical Information

To set the CPU manually, please note the following:

CPU Speed: "Manual" (you can manually set the CPU ratio and frequency)

CPU Ratios: x3.5, x4, x4.5, x5, x5.5, x6, x6.5, x7, x7.5

CPU Frequency: 66, 68, 75, 83, 100, 103, 112, 133MHz

Several options are provided for the CPU external clock. You are recommended to restore to the default setting in case of instability when the external clock exceeds 66MHz.

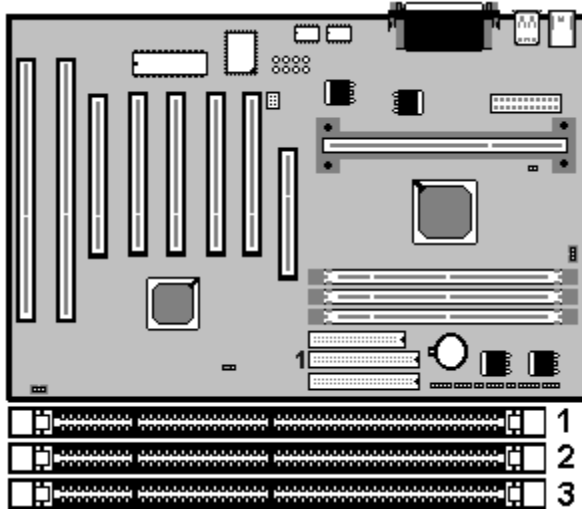
NOTE: System failure may occur if the CPU frequency is set incorrectly. To solve this problem, press the "Insert" key on the keyboard to clear the previously set frequency (i.e., restore the default frequency), and then reboot the system.

- Switching voltage is applied, making the temperature lower and voltage steadier.
- You don't need to adjust Voltage in this Pentium II mainboard. It will automatically send out one VID signal (Voltage Identification) to the mainboard power supply to ask for the voltage it needs.
- The CPU type default setting is Intel Pentium II 250MHz=100 MHz•2.5.
(no jumper on JP1)

Intel Pentium II CPU reference

CPU	Ext. clk	Ratio	L1 cache	L2 cache	Voltage
Intel Pentium II – 500MHz	100MHz	X5	32KB	512KB	2.8V
Intel Pentium II – 450MHz	100MHz	X4.5	32KB	512KB	2.8V
Intel Pentium II – 400MHz	100MHz	X4	32KB	512KB	2.8V
Intel Pentium II – 350MHz	100MHz	X3.5	32KB	512KB	2.8V
Intel Pentium II – 300MHz	100MHz	X3	32KB	512KB	2.8V
Intel Pentium II – 333MHz	66MHz	X5	32KB	512KB	2.8V
Intel Pentium II – 300MHz	66MHz	X4.5	32KB	512KB	2.8V
Intel Pentium II – 266MHz	66MHz	X4	32KB	512KB	2.8V
Intel Pentium II – 233MHz	66MHz	X3.5	32KB	512KB	2.8V

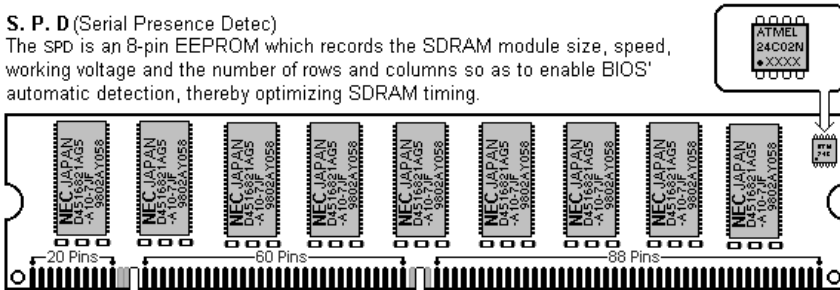
D. EDO/ SDRAM Installation Procedures:



- One 168-pin DIMM module can support up to 384MB at either 3.3V EDO (66MHz) or SDRAM (66MHz/ 100MHz).
- We recommend using SDRAM with Serial Presence Detect that are compliant with PC-100. This will enable BIOS to detect the SDRAM size, speed, voltage, its drive strength and number of row/column addresses, to properly configure it to the system's performance profile.

S. P. D (Serial Presence Detect)

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.



Technical Information

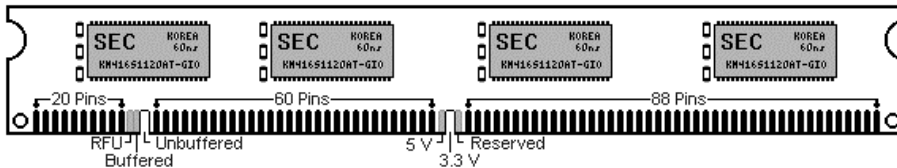
The following table shows memory modules that have passed the **PC-100** specifications.

Brand	Memory size	Number
TOSHIBA	8M X 08=64MB	TC59S6408BFT-80
TOSHIBA	4M X 16=64MB	TC59S6416BFT-80
HITACHI	8M X 08=64MB	HM5264805TT-B60
HITACHI	4M X 16=64MB	HM5264165TT-B60
MITSUBISHI	8M X 08=64MB	M5M4V64S30ATP-8
MITSUBISHI	4M X 16=64MB	M5M4V64S40ATP-8
MITSUBISHI	2M X 08=16MB	M5M4V16S30DTP-8
FUJITSU	8M X 08=64MB	81F64842B-103FN
FUJITSU	4M X 16=64MB	81F641642B-103FN
TI	8M X 08=64MB	TMX664814A81A7ET
TI	2M X 08=16MB	TMX626812BDGE5M
SAMSUNG	8M X 08=64MB	KM48S8030BT-GH
SAMSUNG	4M X 16=64MB	KM416S4030BT-G10
SAMSUNG	2M X 08=16MB	KM48S2020CT-GL
HYUNDAI	8M X 08=64MB	HY57V658020ALTC-10P
HYUNDAI	2M X 08=16MB	HY57V168010C TC-10S
LG	8M X 08=64MB	GM72V66841CT7J
LG	4M X 16=64MB	GM72V661641CT-7J

- First, verify the working voltage of the EDO/ SDRAM module in either DIMM socket.
- This NT928 P2BX only supports 3.3V EDO/ SDRAM modules. The following illustration shows you the difference between 3.3V and 5V to ensure your correct selection of 3.3V DIMM module.
- You can set up the BIOS “Chipset Feature Setup” to the best working condition based on the type of EDO/ SDRAM you are using.
- The BIOS DRAM default setting is 60ns. Change the BIOS “Chipset Feature Setup” default setting to 50ns for better performance, **only if** the chips on all modules installed are marked 50ns.

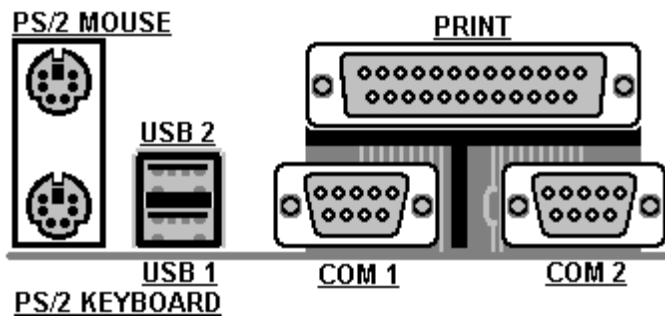
- Change nothing in the BIOS if EDO RAM is used. The BIOS automatically detects the RAM type.
- MEMO for Installing System:
 - Concerning memory setup, you can find out how to from “**Chipset Feature Setup**” under BIOS setup. However, to avoid unstable system operation or system hang, users without engineering background are **not suggested** to change BIOS set up, other than CPU speed.
- The Dual Inline Memory Module (DIMM) must be 3.3 Volt and Unbuffered Synchronous DRAM (SDRAM) 8MB, 16MB, 32MB or 64MB

The following illustration shows the type of DIMM Module required.

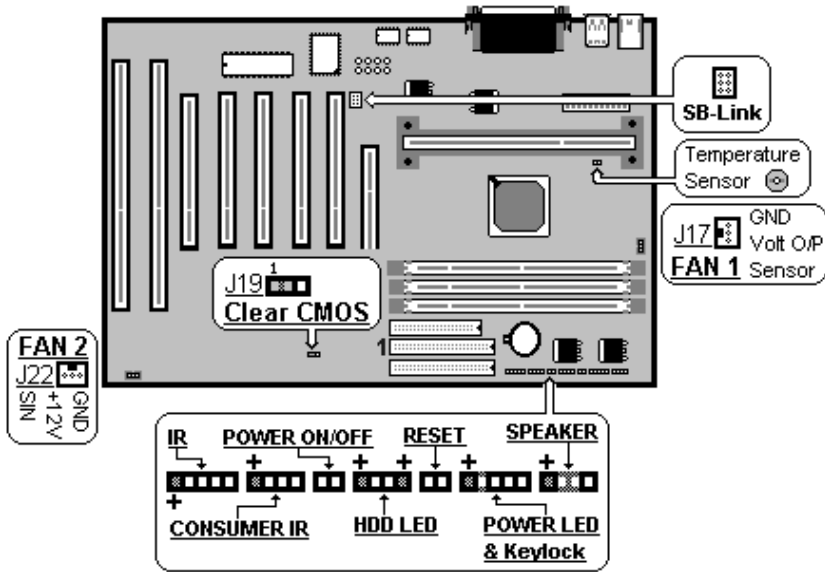


168-PIN SDRAM DIMM Notch Key Definitions

Connector Port Locations



E. Other Jumper Settings



Speaker: Connect to the system's speaker.

- **Keylock:** Keyboard lock switch and Power LED connector.
- **Reset:** Short to restart system.
- **HDD LED:** LED ON lights up when on board PCI IDE hard disk is active.
- **POWER SW (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", you need to hold the button for four seconds in order to turn off the system.
- **J19: Clear CMOS**
Turn off the system and short pins 2-3 to clear CMOS. Then short pins 1-2 before turning it on.

J19	
1-2	Normal operation(Default).
2-3	for clearing CMOS Data.

- **CPU Cooling Fan connector**

This is the connector for CPU cooler. Never use the jumper to short the connector. Serious damages caused this way will void warranty.

- **Creative SB-Link**

It is used to connect the AWE64 or other compatible sound cards so that they are made compatible with the ISA-compatible SB16 sound cards.

F. Note to BIOS Update

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 identified mainboard model (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

- **Make sure your ATX Power Supply can provide the full strength 5V SB-signal required, which is nearly 750mA (Amperage). Your ATX Power Supply should be able to supply at least 1 Ampere.**
- **If you are going to use the function of keyboard and PS/2 mouse power on, the power-switch will be become disabled automatically.**

ROM PC/ISA BIOS (2A69KTJ9)			
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	: AUTO		
UDMA			
IDE Secondary Slave	: AUTO		
UDMA			
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	Selection of this option will allow setting another function key as Hot Key Power ON: Ctrl-F(1/2/3/4/5/6/7/8/9/10/11/12) selects any one. After power is turned off, when user keys in the "Ctrl-F?", it will power on the system.
PS/2 Mouse Left	Will power on the system by PS/2 mouse left.
PS/2 Mouse Right	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 (2A69KTJ9)		
POWER MANAGEMENT SETUP		
AWARD SOFTWARE, INC		
Power Management	: Disabled	** Reload Global Timer Events **
PM Control by APM	: No	IRQ[3-7, 9-15], NMI
Video Off Method	: V/H	: Enabled
Video Off After	: SYNC+Blank	Primary IDE 0
	: Standby	: Disabled
		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
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 the same as the IRQ of the Serial Port to which the modem is connected. Please set to 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.

H. System Health Monitor

This software is supplied on disk.



- **Fan Monitoring:**

The NT928 BXD provides for two fan connectors, one is for the CPU, the other for an additional housing fan. When the fan's speed is working abnormally, there will be a warning (**Speaker Alarm**) issued 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 software. Refer to Page 16 for jumper selection (System Health Monitor).

- **CPU Thermal Protection:**

The **NT928 P2BXD** 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 is implemented automatically by BIOS or SM10, no hardware installation is needed. Refer to Page16 (System Health Monitor).

This mainboard also provides an option to use a CPU cooling fan with **Thermal Sensor** on it. The CPU thermal sensor should be connected to **J16**.

- **System Voltage Monitoring:**

NT928 P2BXD 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 the required voltage is abnormal to a 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 is implemented automatically by BIOS and SM10, no hardware installation is needed. Refer to Page 19 (System Health Monitor)

I. EDO/ SDRAM Configuration Table:

DIMM1	DIMM2	DIMM3	TOTAL
8MB	8MB	---	16MBytes
---	8MB	8MB	16MBytes
8MB	---	8MB	16MBytes
---	16MB	---	16MBytes
8MB	8MB	8MB	24MBytes
16MB	8MB	---	24MBytes
---	16MB	8MB	24MBytes
16MB	---	8MB	24MBytes
16MB	16MB	---	32MBytes
---	16MB	16MB	32MBytes
16MB	---	16MB	32MBytes
---	32MB	---	32MBytes
16MB	16MB	8MB	40MBytes
8MB	16MB	16MB	40MBytes
32MB	8MB	---	40Mbytes
---	32MB	8MB	40MBytes
16MB	16MB	16MB	48MBytes
32MB	8MB	8MB	48MBytes
32MB	16MB	---	48MBytes
---	32MB	16MB	48MBytes
32MB	32MB	---	64MBytes
---	32MB	32MB	64MBytes
---	64MB	---	64MBytes
32MB	16MB	16MB	64MBytes
32MB	32MB	8MB	72MBytes
8MB	32MB	32MB	72MBytes
64MB	8MB	---	72Mbytes
---	64MB	8MB	72MBytes
32MB	32MB	16MB	80MBytes
16MB	32MB	32MB	80MBytes
64MB	16MB	---	80MBytes
---	64MB	16MB	80MBytes

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32MB	32MB	32MB	96MBytes
64MB	32MB	---	96MBytes
---	64MB	32MB	96MBytes
16MB	64MB	16MB	96MBytes
64MB	64MB	---	128MBytes
---	64MB	64MB	128MBytes
64MB	32MB	32MB	128MBytes
---	128MB	---	128MBytes
64MB	64MB	8MB	136MBytes
8MB	64MB	64MB	136MBytes
128MB	8MB	---	136MBytes
---	128MB	8MB	136MBytes
64MB	64MB	16MB	144MBytes
16MB	64MB	64MB	144MBytes
128MB	16MB	---	144Mbytes
---	128MB	16MB	144MBytes
64MB	64MB	32MB	160MBytes
32MB	64MB	64MB	160MBytes
128MB	32MB	---	160MBytes
---	128MB	32MB	160MBytes
64MB	64MB	64MB	192MBytes
128MB	64MB	---	192MBytes
---	128MB	64MB	192MBytes
32MB	128MB	32MB	192MBytes
128MB	128MB	---	256MBytes
---	128MB	128MB	256MBytes
64MB	128MB	64MB	256MBytes
---	256MB	---	256MBytes
128MB	128MB	128MB	384MBytes
256MB	64MB	64	384MBytes
256MB	128MB	---	384MBytes
---	256MB	128MB	384MBytes

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 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 (2A69KTJ9) CMOS SETUP UTILITY AWARD SOFTWARE, INC.	
STANDARD CMOS SETUP	INTEGRATED PERIPHERALS
BIOS FEATURE SETUP	SUPERVISOR PASSWORD
CHIPSET FEATURES SETUP	USER PASSWORD
POWER MANAGEMENT SETUP	IDE HDD AUTO DETECTION
PNP/PCI CONFIGURATION	HDD LOW LEVEL FORMAT
LOAD BIOS DEFAULTS	SAVE & EXIT SETUP
LOAD SETUP DEFAULTS	EXIT WITHOUT SAVING
Esc : Quit ←↑↓→ : Select Item	
F10 : Save & Exit Setup (Shift) F2 : Change Color	
Time, Data, Hard Disk Type...	

Technical Information

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.

ROM PCI/ISA BIOS (2A5IDA3A)								
STANDARD CMOS SETUP								
AWARD SOFTWARE, INC.								
Date (mm:dd:yy) : Wed, Dec 28 1994								
Time (hh:mm:ss) : 12: 35 : 50								
HARD DISKS	TYPE	SIZE	CYLS	HEAD	PRECOMP	LANDZ	SECTOR	MODE
Primary Master	: None	0	0	0	0	0	0	-----
Primary Slave	: None	0	0	0	0	0	0	-----
Secondary Master	: None	0	0	0	0	0	0	-----
Secondary Slave	: None	0	0	0	0	0	0	-----
Drive A : 1.44M, 3.5 in.								
Drive B : None								
3 Mode : Disabled								
Video : EGA/VGA								
Halt On : All Errors								
				Base Memory : 640K				
				Extended Memory : 7168K				
				Other Memory : 384K				
				Total Memory : 8192K				
ESC : Quit				↑↓ →← : Select Item		PU/PD/+/- : Modify		
F1 : Help				(Shift) F2 : Change Color				

2. BIOS Features Setup

ROM PCI/ISA BIOS (2A69KTJ9)			
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
Quick Power On Self Test	: Enabled	D0000-D3FFF Shadow	: Disabled
Boot Sequence	: A, C, SCSI	D4000-D7FFF Shadow	: Disabled
Swap Floppy Drive	: Disabled	D8000-DBFFF Shadow	: Disabled
Boot Up Floppy Seek	: Enabled	DC000-DFFFF Shadow	: Disabled
Boot Up NumLock Status	: On		
Boot Up System Speed	: High		
Gate A20 Option	: Fast		
Typematic Rate Setting	: Disabled		
Typematic Rate (Chars/Sec)	: 6		
Typematic Delay (Msec)	: 250		
Security Option	: Setup		
PS/2 mouse function control	: Enabled	Esc : Quit	↑↓→← : Selection Item
PCI/VGA Palette Snoop	: Disabled	F1 : Help	PU/PD/+/- : Modify
Assign IRQ For VGA	: Enabled	F5 : Old Values	(Shift) F2 : Color
OS Select For DRAM > 64MB	: Non-OS2	F6 : Load BIOS Default	
Report No FDD For WIN 95	: No	F7 : Load Setup Default	

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.

Technical Information

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

Boot Up System Speed

It selects the default system speed - the speed that the system will run immediately after power up.

High:	Set the speed to high
Low:	Set the speed to low

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.

Assign IRQ for VGA

When this item is enabled, the system will assign an IRQ for VGA. If this item is disabled, the VGA will not occupy an IRQ; therefore the IRQ of VGA will be released for other usage. The default value is Enabled.

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.

Report No FDD For WIN95

For Windows 3.1x users set "No"; for Windows 95 users set "No" or "Yes". The default value is no.

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 (2A69KTJ9)			
CHIPSET FEATURES SETUP			
AWARD SOFTWARE, INC			
Auto Configuration	: Enabled	Auto Detect DIMM/ PCI Clk	: Enabled
EDO DRAM Speed Selection	: 60ns	CPU Speed	: Manual
EDO CASx# MA Wait State	: 2	CPU Ratio	: X 2.5
EDO RASx# Wait State	: 2	CPU Frequency	: 100 MHz
SDRAM RAS-to CAS Delay	: 3	Spread Spectrum	: Disabled
SDRAM RAS Precharge Time	: 3	CPU Warning Temperature	: Disabled
SDRAM CAS latency Time	: Auto	Current CPU Temperature	: 28•/ 82•
DRAM Data Integrity Mode	: Non-ECC	Current SYSFAN Speed	:4285 RPM
System BIOS Cacheable	: Enabled	Current CPUFAN Speed	:4000 RPM
Video BIOS Cacheable	: Enabled	Current Vin3 (V)	: 2.88V
Video RAM Cacheable	: Disabled		
8 Bit I/O Recovery Time	: 1		
16 Bit I/O Recovery Time	: 1		
Memory Hole At 15M-16M	: Disabled		
Passive Release	: Enabled		
Delayed Transaction	: Disabled		
AGP Aperture Size (MB)	: 64		
		Esc : Quit	↑↓→← : Selection Item
		F1 : Help	PU/PD/+/- : Modify
		F5 : Old Values	(Shift) F2 : Color
		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.

Technical Information

Auto Configuration: Selects predefined values of chipset parameters. When Disabled, chipset parameters revert to setup information stored in CMOS. Many fields in this screen are not available when Auto Configuration is Enabled.

NOTE: When you insert slower memory modules in the system and set a faster timing, maybe, the system will hang up.

EDO DRAM Speed Selection: The default value is 60ns.

50ns:	for 50ns EDO DRAM/SDRM.
60ns:	for 60ns EDO DRAM/SDRM.

EDO CASx# MA Wait State: The default value is 2.

1:	This item allows you to select MA Wait State.
2:	

EDO RASx# Wait State: The default value is 2.

1:	This sets the relative delay between the row and column address strobos from DRAM (EDO).
2:	

SDRAM RAS-to-CAS Delay: The default value is 3.

3:	For 66/83 MHz SDRAM DIMM module.
2:	For 100 MHz SDRAM DIMM module.

SDRAM Precharge Time: The default value is 3.

3:	For 66/83 MHz SDRAM DIMM module.
2:	For 100 MHz SDRAM DIMM module.

SDRAM CAS latency Time: The default value is 3.

2:	For 100 MHz SDRAM DIMM module.
3:	For 66/83 MHz SDRAM DIMM module.

DRAM Data Integrity Mode: The default value is Non-ECC.

Non-ECC:	For 64bit standard type DIMM module.
ECC:	For 72bit ECC type DIMM module.

System BIOS Cacheable: The default value is Enabled.

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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 BIOS Cacheable: The default value is Enabled.

Enabled:	This field Enables Video BIOS Cacheable to speed up VGA performance.
Disabled:	Disables the Video BIOS Cacheable function.

Video RAM Cacheable: 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.

8/16 Bit I/O Recovery Time: The default value is 1.

8/16 Bit I/O Recovery Time: This field defines the recovery time from 1 to 8 for 8-bit I/O.

16 Bit I/O Recovery Time: To define the recovery time from 1 to 4 for 16-bit I/O.

Memory Hole at 15M-16M: The default value is Disabled.

Enabled:	This field enables the main memory (15~16MB) remap to ISA BUS. This feature reserves 15MB to 16MB memory address space to ISA expansion card that specifically require this setting.
Disabled:	Normal Setting.

Passive Release: The default value is Enabled.

Enabled:	When Enabled, CPU to PCI bus accesses are allowed during passive release. Otherwise, the arbiter only accepts another PCI master access to local DRAM...
Disabled:	

Delayed Transaction: The default value is Disabled.

Enabled:	For slow speed ISA device in system.
Disabled:	Normal operation.

Technical Information

AGP Aperture Size(MB): The default value is 64.

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.

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 SYSFAN Speed

It shows the running speed of the system fan.

Current CPUFAN Speed

It shows the running speed of the CPU fan.

Current Vin3 (3)

It shows the Vcore voltage.

4. Power Management

ROM PCI / ISA BIOS (2A69KTJ9) 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	: NA	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%	
VGA Active Monitor	: Enabled	
Soft-Off by PWR-BTTN	: Instant-Off	
Resume by Ring	: Disabled	
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

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.

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.

No: System BIOS will ignore APM when power managing the system.

Technical Information

Yes: System BIOS will wait for APM's prompt before it enters any PM mode e.g. DOZE, STANDBY or SUSPEND.

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 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.

Doze Mode: The default value is Disabled. * Remark 1.

Disable: System will never enter DOZE 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 DOZE mode. If any item defined in (J) is enabled and active, DOZE timer will be reloaded.

NOTE: Normally, STANDBY mode puts the system into low speed or 8 MHz, screen may be off depending on (E)

Standby Mode: The default value is Disabled. * Remark 1.

Disabled: System will never enter STANDBY 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 STANDBY mode. If any item defined in (J) is enabled and active, STANDBY timer will be reloaded.

Normally, STANDBY mode puts the system into low speed or 8, screen may be off depending on (E).

Suspend Mode: The default value is Disabled. * Remark 1.

Disable: 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.

NOTE: Normally, SUSPEND mode puts the system into low speed or 8 MHz, clock is stopped, screen may be off depending on (E).

* Remark 1: All items mark with (*) in this menu, will be loaded with predefined values as long as the item "Power Management" is not configured to "User Defined" These items are:

Item "System Doze" , "System Standby" and "System Suspend"

Remark 2: Although the item "HDD Power Down" is not controlled by item "Power Management" in terms of timer value, the HDD (s) will not power down if the global power management is disabled!

5. PNP/PCI Configuration Setup

ROM PCI/ISA BIOS PNP/PCI CONFIGURATION AWARD SOFTWARE, INC.			
PNP OS Installed	: No	PCI IDE IRQ Map To	: PCI-AUTO
Resources Contorlled By	: Manual	Primary IDE INT#	: A
Reset Configuration Data	: Disabled	Secondary IDE INT#	: B
IRQ-3 assigned to :	Legacy ISA	Used MEM base addr	: N/A
IRQ-4 assigned to :	Legacy ISA	Assign IRQ For USB	: Disabled
IRQ-5 assigned to :	PCI/ISA PnP		
IRQ-7 assigned to :	PCI/ISA PnP		
IRQ-9 assigned to :	PCI/ISA PnP		
IRQ-10 assigned to :	PCI/ISA PnP		
IRQ-11 assigned to :	PCI/ISA PnP		
IRQ-12 assigned to :	PCI/ISA PnP		
IRQ-14 assigned to :	PCI/ISA PnP		
IRQ-15 assigned to :	PCI/ISA PnP		
DMA-0 assigned to :	PCI/ISA PnP		
DMA-1 assigned to :	PCI/ISA PnP	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.

Technical Information

Resources Controlled By: The default value is 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.

Disabled: Normal Setting.

Enabled: If you had plugged some Legacy cards in the system and there were record into ESCD (Extended System Configuration Data), you can set this field to Enabled to clear ESCD.

PCI IDE IRQ Map To: The default value is PCI-AUTO.

When you have true PCI card (s) plugged into the system, you will not need to change anything here in the **SETUP** program. However, if you do not know whether you have true PCI card or not, refer to your PCI card user's manual.

When you have a Legacy card to be plugged into the system, a proper setting is extremely important or it may cause the system hang up. The diagram shown below tells you how the Rotating Priority Mechanism is designed.

Primary IDE INT#: The default value is A.

To tell which INT# does the PCI IDE card is used for its interrupts.

Secondary IDE INT#: The default value is B.

To tell which INT# does the PCI IDE card is used for its interrupts.

Used MEM base addr: The default value is N/A.

The Used MEM base addr (CB00, CC00, D000, D400, D800, DC00) and Used MEM Length (8K, 16K, 32K, 64K) were to support some specific ISA Legacy cards with requested memory space below 1M address. Now with these two functions, users can define where the used memory address is located and its length of the legacy area corresponding. Based on there, BIOS will skip the UMB area that is used by the legacy device to avoid memory space conflict. For example, if users select "D000" for "Used MEM base addr" and "16K" for "Used MEM Length", that means the address

region D0000h-D3fffh is occupied by ISA legacy cards, and this BIOS will not assign this region for PNP/ISA and PCI cards.

6. 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>.

7. 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>.

8. Integrated Peripherals Setup

ROM PC/ISA BIOS
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	: Disabled		
POWER ON Function	: Hot KEY		
		Esc : Quit ↑↓→←	:Item
Hot Key Power ON	: Ctrl-F12	Selection	
		F1 : Help	Modify
KBC input clock	: 8MHz	PU/PD/+/- :	
		F5 : Old Values (Shift)F2	Color
Onboard FDC Controller	: Enabled	:	
Onboard Serial Port 1	: 3F8H / IRQ4	F6 : Load BIOS Default	
		F7 : Load Setup Default	

Technical Information

➤ 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.

IDE HDD Block Mode: Select Enabled only if your hard drivers support block mode.

Enabled:	Enable IDE HDD Block Mode. Provides higher HDD transfer rates.
Disabled:	Disabled IDE HDD Block Mode.

IDE Primary (Secondary) Master / Slave PIO: The default value is Auto. This field is Select Primary (Secondary) IDE PIO Mode (0~4) for HDD.

IDE Primary (Secondary) Master/Slave UDMA: The default value is Auto.

Auto:	Select Primary (Secondary) IDE used Ultra DMA HDD.
Disabled:	Disabled Primary (Secondary) IDE used Ultra DMA HDD.

IDE Primary Master PIO: The default value is Auto.

Auto:	BIOS automatically detects the Onboard Primary Master PCI IDE HDD Accessing mode.
Mode 0~4:	Manually sets the IDE Accessing mode.

IDE Primary Slave PIO: The default value is Auto.

Auto:	BIOS will automatically detect the Onboard Primary Slave PCI IDE HDD Accessing mode.
Mode 0~4:	Manually sets the IDE Accessing mode.

IDE Secondary Master PIO: The default value is Auto.

Auto:	BIOS automatically detects the Onboard Secondary Master PCI IDE HDD Accessing mode.
Mode 0~4:	Manually sets the IDE Accessing mode.

IDE Secondary Slave PIO: The default value is Auto.

Auto:	BIOS automatically detects the Onboard Secondary Slave PCI IDE HDD Accessing mode.
Mode 0~4:	Manually sets the IDE Accessing mode.

On-Chip Primary PCI IDE: The default value is Enabled.

Enabled:	Enabled Onboard 1 st channel IDE port.
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Disabled:	Disabled Onboard 1 st channel IDE port. When use On-card (PCI or ISA card) IDE connector.
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On-chip Secondary PCI IDE: The default value is Enabled.

Enabled:	Enabled Onboard 2nd channel IDE port.
Disabled:	Disabled Onboard 2nd channel IDE port. When use On-card (PCI or ISA card) IDE connector.

USB Keyboard Support: The default value is Disable.

Enabled:	Enable USB Keyboard Support.
Disabled:	Disable USB Keyboard Support.

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 ISA FDC's controller.

Onboard Serial Port 1: This field allows the user to select the serial port. The default value is 3F8H / IRQ4.

COM 1:	Enable Onboard Serial port 1 and address is 3F8H / IRQ 4.
COM 2:	Enable Onboard Serial port 1 and address is 2F8H / IRQ 3.
COM 3:	Enable Onboard Serial port 1 and address is 3E8H / IRQ 4.
COM 4:	Enable Onboard Serial port 1 and address is 2E8H / IRQ 3.
Disabled:	Disable Onboard Serial port 1 controller.

Onboard Serial Port 2: This field allows the user to select the serial port. The default value is 2F8H / IRQ3.

COM 1:	Enable Onboard Serial port 2 and address is 3F8H / IRQ 4.
COM 2:	Enable Onboard Serial port 2 and address is 2F8H / IRQ 3.
COM 3:	Enable Onboard Serial port 2 and address is 3E8H / IRQ 4.
COM 4:	Enable Onboard Serial port 2 and address is 2E8H / IRQ 3.
Disabled:	Disable Onboard Serial port 2 controller.

Onboard Parallel port: This field allows the user to select the LPT port. The default value is 378H / IRQ 7.

378H:	Enable Onboard LPT port and address is 378H and IRQ 7.
--------------	--

Technical Information

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.

ECP Mode USE DMA: The default value is DMA 3.

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.

9. Password Setting

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 enter

Setup. If you select Setup at Security Option of BIOS Features Setup Menu, you will be prompted only when you try to enter Setup.

10. 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.

11. 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

Technical Information

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.

12. Exiting the Setup Program

To exit the Setup program, do the following:

If you want to save your change:

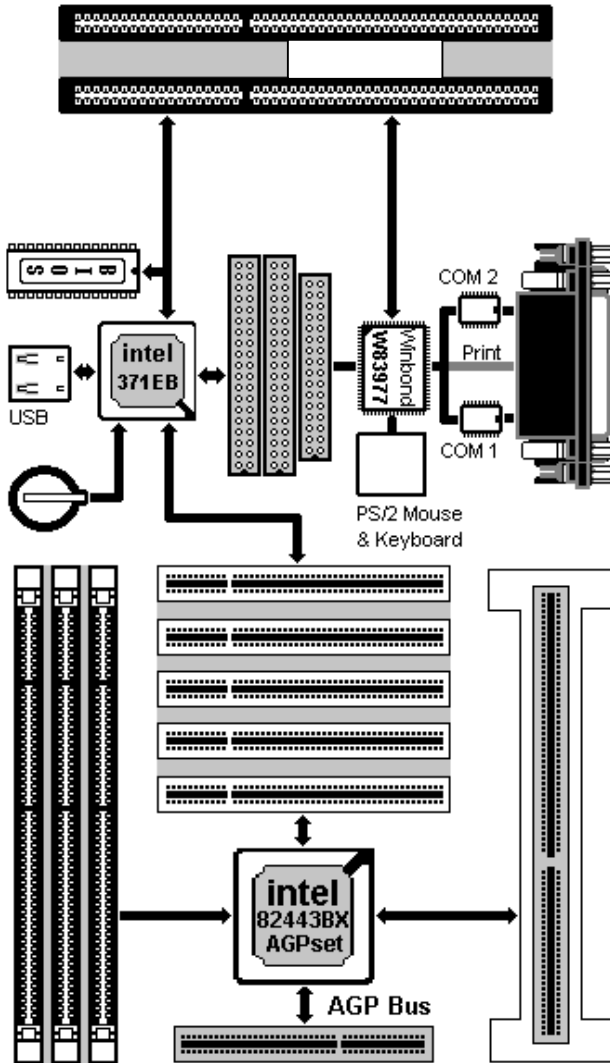
- a. At the Main menu, select "Save & Exit Setup", then press [Enter]
- b. Press [Y] then [Enter] to confirm. The system will boot with your new BIOS setting in effect .

If you want to abandon your changes:


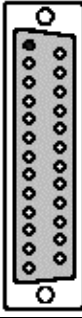
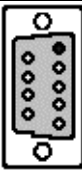
- a. At the Main Menu, select "Exit Without Saving", then press [Enter].
- b. Press [Y] then [Enter] to confirm. The system will reboot with the original BIOS setting in effect.

Technical information

A. Block Diagram



B. I/O Connector Map			ISA Bus			
			GND	1	-I/OCH CHK	
			RESET	2	SD 07	
			+5V	3	SD 06	
Floppy Disk Connector			IRQ 9	4	SD 05	
			-5V	5	SD 04	
			DRQ2	6	SD 03	
			-12V	7	SD 02	
			OVS	8	SD 01	
			+12V	9	SD 00	
			GND	10	-I/O CH RDY	
			-Index	11	AEN	
			-MEMR	12	SA 19	
			-IOW	13	SA 18	
			-IOR	14	SA 17	
			-DACK3	15	SA 16	
			-DRQ3	16	SA 15	
			-DACK1	17	SA 14	
			-DRQ1	18	SA 13	
			-REFRESH	19	SA 12	
			BCLK	20	SA 11	
			IRQ 7	21	SA 10	
			IRQ 6	22	SA 09	
			IRQ 5	23	SA 08	
			IRQ 4	24	SA 07	
			IRQ 3	25	SA 06	
			-DACK2	26	SA 05	
			T/C	27	SA 04	
			BALE	28	SA 03	
			+5V	29	SA 02	
			OSC	30	SA 01	
			GND	31	SA 00	
IDE Connector			HOST Data 8	-MEMCS 16	1	SBHE
			HOST Data 9	-I/OCS 16	2	LA 23
			HOST Data 10	IRQ 10	3	LA 22
			HOST Data 11	IRQ 11	4	LA 21
			HOST Data 12	IRQ 12	5	LA 20
			HOST Data 13	IRQ 15	6	LA 19
			HOST Data 14	IRQ 14	7	LA 18
			HOST Data 15	IRQ 14	8	LA 17
			Key	-DACK 0	9	-MEMR
			Ground	DRQ 0	10	-MEMW
			Ground	-DACK 5	11	SD 08
			Ground	DRQ 5	12	SD 09
			BALE	-DACK 6	13	SD 10
			Ground	DRQ 6	14	SD 11
			-IOCS 16	-DACK 7	15	SD 12
			Ground	DRQ 7	16	SD 13
			Addr2	+5V	17	SD 14
			-Chip select 1	-MASTER	18	SD 15
			Ground	GND		

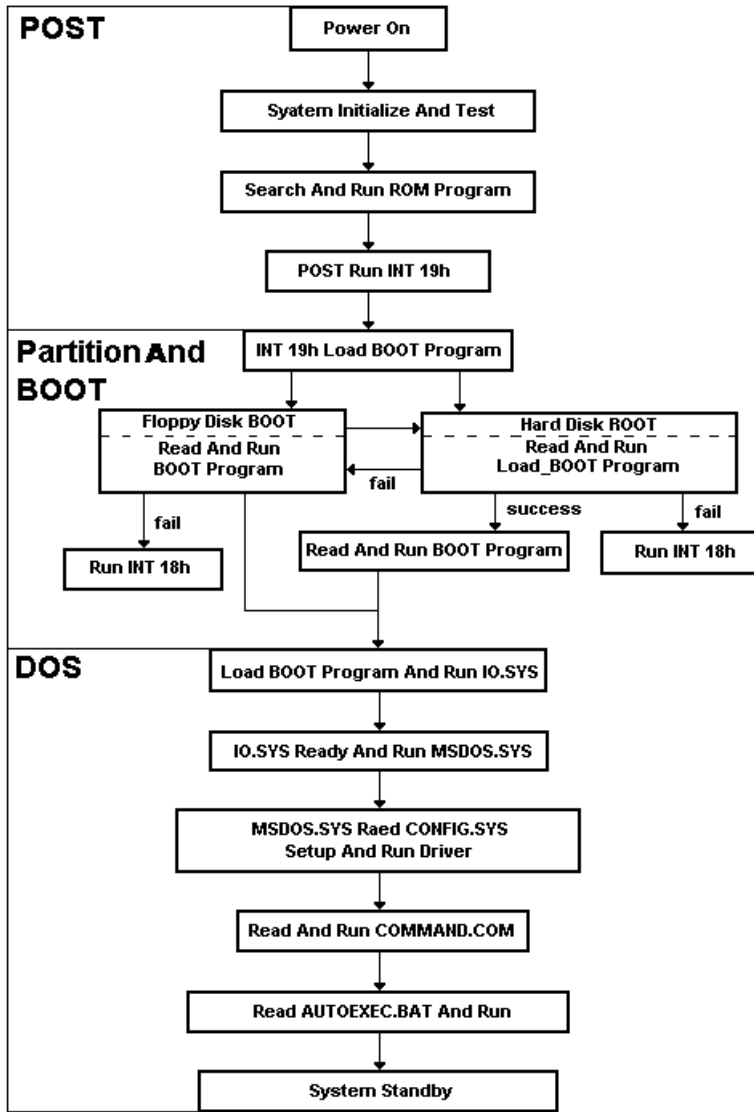
ATX Power Supply Connector		Parallel port connector		
3.3 V 11		1 3.3 V		
-12 V 12		2 3.3 V		
GND 13		-STROBE 1		
PS-ON 14		Data Bit 0 2		
GND 15		Data Bit 1 3		
GND 16		Data Bit 2 4		
GND 17		Data Bit 3 5		
-5 V 18		Data Bit 4 6		
5 V 19		Data Bit 5 7		
5 V 20		Data Bit 6 8		
Serial Port connector		Data Bit 7 9		14 -AUTO
	1 DCD	-ACJ 10		15 -ERROR
	2 SIN	BUSY 11		16 -INIT
	3 SOUT	PE 12	17 -SLCT IN	
	4 DTR	SLCT 13	18 Ground	
	5 GND		19 Ground	
		PS/2 Mouse connector signal line		
DSR 6		Data(Red) 1	4 NC	
RTS 7		Clock(Blue) 2	5 VCC(Yellow)	
CTS 8		GND(Green) 3		
RI 9				

C. 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 Mode 5 is unlikely to be implemented.

D. Computer BOOT flow chart



E. The difference between Intel 440LX and 440BX Chipset

	INTEL 440 LX	INTEL 440 EX	Intel 440BX Chipset
CPU support	Pentium II or PRO	Pentium II	Pentium II
Memory size	512MB	256MB	1 GB
Memory	EDO/ SDRAM	EDO/ SDRAM	EDO(66MHz)/SDRAM
Memory Clock	66MHz	66MHz	100MHz
Ex. Clock	66MHz	66MHz	66MHz or 100MHz
ACPI	Yes	Yes	ACPI or Mobile
AGP Bus	Yes	Yes	Yes
USB	2 Port	2 Port	2 Port
Ultra DMA33	Yes	Yes	Yes

- **Ultra DMA/33 (Ultra ATA)**

This new specification of IDE HDD, set up by Intel and Quantum together, has first been supported by Fireball ST Series HDD, with the highest transfer rate of 33.3MB/s, requires drivers to support it. Without driver, PIO mode 4 is in charge of access performance instead.

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

This "Advanced Configuration and Power Interface" co-authored by Intel, Microsoft, 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 "On Now" function; when you start the system, what is seen on the screen, is in the same condition as the last time before the system was shut down.
- (3). Enhances the system configuration like PnP, DMI....

- **USB (Universal Serial Bus)**

This new Bus specification by Intel etc., is connected by a USB connector, making it possible for peripherals to have the "plug and play" function without an interface card. The USB connector can support 127 peripherals at the same time.

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

- **SPP (Standard Parallel Port)**

- The current commonly used standard mode.

- **ECP (Extended Capabilities Port)**

- Its main feature is using a 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)**

- Bi-directional block transmission allows 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.

- **IrDA (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 "potential" failure so the user has sufficient time to backup data or replace the hard disk.

F. 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.

G. 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 interface (CD-ROM).

H. 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

I. 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 on-board 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-FFFFFF 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 basic R/W functionality
BE	Program default values into chipset according to the MODBIN Chipset Default Table
09	1. Issue CPU ID instruction to identify CPU type 2. Program the configuration register of Cyrix CPU according to the MODBIN Cyrix Register Table 3. OEM specific cache initialization
0A	1. Initialize the first 32 interrupt vectors with corresponding interrupt handlers Initialize INT no from 33-120 with Dummy (Spurious) Interrupt Handler 2. Early Power Management initialization (OEM specific)

POST (HEX)	Description
0B	<ol style="list-style-type: none"> 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) <ul style="list-style-type: none"> - 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)
0C	Initialization of the BIOS Data Area (40:0-40:FF)
0D	<ol style="list-style-type: none"> 1. P5 Multi-P BIOS Only Initialize 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	<ol style="list-style-type: none"> 1. Initialize the APIC (Multi-Processor BIOS ONLY) 2. Test video RAM (If Monochrome display device found) 3. Show messages including: <ul style="list-style-type: none"> - 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

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POST (HEX)	Description
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 Initialize 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 Initialize 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 on-board super I/O chips (if any) including COM ports, LPT ports, FDD port... according to setup value 3. Program onboard audio devices
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 at 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 Auto-Table
41 	Initialize floppy disk drive controller

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POST (HEX)	Description
42 	<ol style="list-style-type: none"> 1. Cut IRQ 12 connection if PS/2 mouse is not installed 2. Install IDE Hard Drives <ul style="list-style-type: none"> - 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 	<ol style="list-style-type: none"> 1. If there is any error detected (such as video, keyboard..), show error messages on the screen and wait for the user to correct 2. Enable "Far Hit" for Cyrix 6x86 CPU
4F 	<ol style="list-style-type: none"> 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
52 	<ol style="list-style-type: none"> 1. Initialize all ISA ROMs 2. Later PCI initializations (PCI BIOS ONLY) <ul style="list-style-type: none"> - 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 <ul style="list-style-type: none"> - Enable/Disable global PM - APM interface initialization
53 	<ol style="list-style-type: none"> 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

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POST (HEX)	Descriptions
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, typematic rate and typematic speed according to setup setting
63 	1. If there is any change in the hardware configuration, update the ESCD information (PnP BIOS ONLY) 2. If there is any change in the hardware configuration, update the DMI data pool (DMI BIOS ONLY) 3. Clear memory that has been used 4. Boot system via INT 19h
FF 	System Booting. BIOS has passed control to the operating system.

Unexpected Errors:

POST (HEX)	Description
B0 	If interrupt occurs in protected mode
B1 	Unclaimed NMI occurs

J. Problem Sheet

Customer			
Name		Tel	
address		Fax	

Mainboard			
Model		Mainboard Rev	
Serial No.		BIOS version	

Configuration					
CPU	Brand		RAM	Brand	
	Type			Type & Size	
	Voltage			Speed	
Floppy disk	Brand		VGA card	Brand	
	Mode			Chipset	
	Size			RAM Type	
Hard disk	Brand		CD-ROM	Brand	
	Mode			Mode	
	Size			Speed	
Sound card	Brand		LAN card	Brand	
	Mode			Mode	
	Remark			PCI/ISA Bus	
Mouse	Brand		O/S	Brand	
	Mode			Name	
	PS/2 or Serial			Version	
Autoexec.bat			Config.sys		
Problem Description					