



# KP 6 - FX 2

A Pentium<sup>®</sup> II Processor based  
mainboard

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## **Technical Support Services**

If you need additional information or help during installation or normal use of this product, contact your retailer. If your retailer can not help you may E-Mail us with any questions at the following address [epox@epox.com](mailto:epox@epox.com).

Record your serial number before installing your KP6-FX 2 mainboard. (the serial number is located near the ISA slots at the edge of the board)

*EPoX motherboard serial number:* \_\_\_\_\_

### **BIOS Upgrades**

Please use either our Web Site or BBS for current BIOS Upgrades.

### **Internet Access**

<http://www.epox.com>  
[sales@epox.com](mailto:sales@epox.com)  
[tech@epox.com](mailto:tech@epox.com)

### **Modem Access**

886-218-0997 (Taiwan)  
714-990-8973 (USA)  
31-182-618451 (The Netherlands)

You can access this number via a Hayes-compatible modem with a 2,400 to 28,800 baud rate. The following setup format is required:

8 Data Bits, No Parity, 1 Stop Bit.

If your modem is unable to connect at higher baud rates, try connecting at 2,400 baud before contacting Technical Support.

*Thank you for using EPoX mainboard*

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The product name and revision number are both printed on the mainboard itself.

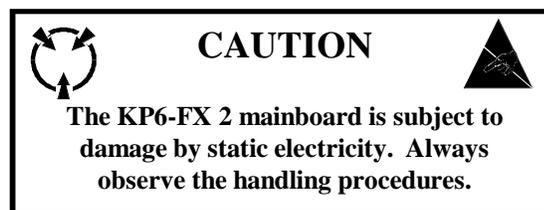
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## Handling Procedures

**Static electricity can severely damage your equipment.** Handle the KP6-FX 2 and any other device in your system with care and avoid contact with components on the card.

Always work on an antistatic surface to avoid possible damage to the card from static discharge. The packing material placed on a table top makes a good antistatic work surface.

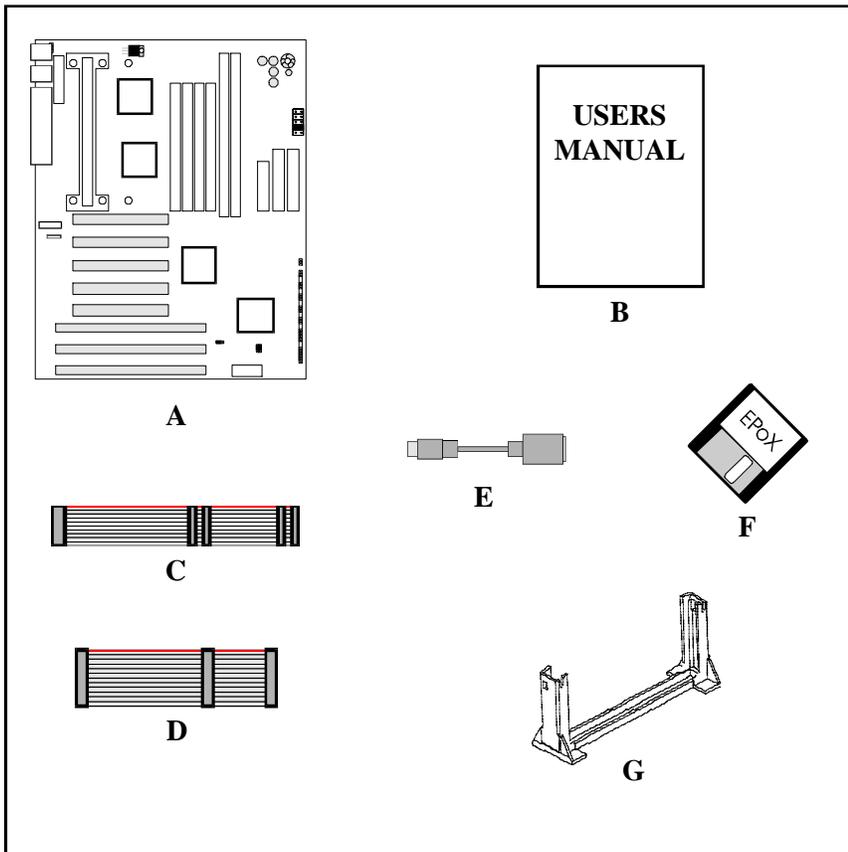
We assume no responsibility for any damage to the KP6-FX 2 mainboard that results from failure to follow installation instructions or failure to observe safety precautions.



## Parts Checklist

Please make sure your package is complete before you start your installation. If you discover a damaged or missing item, please contact your retailer.

- Ö A. 1 KP6-FX 2 mainboard
- Ö B. 1 Users manual
- Ö C. 1 Floppy ribbon cable
- Ö D. 2 IDE ribbon cables
- Ö E. PS/2 to AT keyboard connector adapter
- Ö F. Bus Master Driver
- Ö G. Retention Module



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# Introduction

*EPoX* is proud to introduce the KP6-FX 2 mainboard to support Intel Pentium® II Processor Intel's latest technology in CPU's. The KP6-FX 2 is based on Intel's 82440FX chipset, and supports uni-Pentium® II Processor processor. Full specifications include 4 PCI and 4 ISA slots, USB ready, and a special ring-in feature all built into full ATX format. KP6-FX 2 also supports a memory capacity upto 1GB to run the most demanding applications. The KP6-FX 2 also uses Easy-Setting-Single-Jumper (ESSJ) to simplify your CPU clock setting.

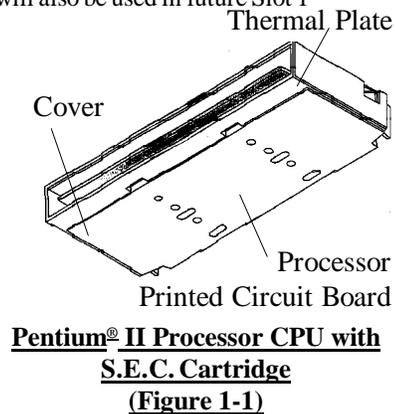
## 1-1 Pentium® II Processor Overview

The Pentium® II Processor processor is follow-on to the Pentium® Processor. The Pentium® II Processor, like the Pentium® Pro processor implements a *Dynamic Execution* micro-architecture -- a unique combination of multiple branch prediction, data flow analysis, and speculative execution. This enables the Pentium® II Processor to deliver higher performance than the Pentium® processor, while maintaining binary compatibility with all previous Intel architecture processors.

A significant feature of the Pentium® II Processor, from a system perspective, is the build-in direct multiprocessing support. In order to achieve multi-processing, and maintain memory and I/O bandwidth to support them, new system designs are needed. For systems with dual processors, it is important to consider the additional power burdens and signal integrity issues of supporting multiple loads on a high speed bus. The Pentium® II Processor card supports both uni-processor and dual processor implementations.

The Pentium® II Processor utilizes Single Edge Contact (S.E.C.) (*Figure 1-1*) cartridge packaging technology. The S.E.C. cartridge allows the L2 cache to remain tightly coupled to the processor, while maintaining flexibility when implementing high performance processors into OEM systems. The second level cache is performance optimized and tested at the cartridge level. The S.E.C. cartridge utilizes surface mounted core components and a printed circuit board with an edge finger connection. The S.E.C. cartridge package introduced on the Pentium® II Processor will also be used in future Slot 1 processors.

The S.E.C. cartridge has the following features: a thermal plate, a cover and a PCB with an edge finger connection. The thermal plate allows standardized heatsink attachment or customized thermal solutions. The thermal plate enables a reusable heatsink to minimize fit issues for serviceability, upgradability and replacement. The full enclosure also protects the surface mount components. The edge finger connection maintains socketability for system configuration. The edge finger connector is notated as 'Slot 1 connector' in this and other documentation.



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### **1-1.1 S.E.C. Cartridge Overview**

The entire enclosed product is called the Pentium® II Processor. The packaging technology and each of the physical elements of the product are referred to using accurate technical descriptions. This allows clear reference to the products as just a processor. This is the model used in past packaging technologies like PGA, TCP, PQFP, DIP, etc.

### **1-1.2 S.E.C. Cartridge Terminology**

- **Pentium® II Processor**  
The new enclosed card packaging technology is called a “Single Edge Contact cartridge.” This is similar to previous names for packaging technology such as PGA or TCP.
- **Processor card**  
The green PCB (with or without components on it)
- **Processor core**  
The silicon on the PLGA package on the PCB
- **Cover**  
The plastic cover on the opposite side from the thermal plate.
- **Slot 1**  
The slot that the S.E.C. cartridge plugs into, just as the Pentium® Pro processor uses Socket 8.
- **Retention mechanism**  
Formerly ‘retention module’ the dual posts, etc. that hold the cartridge in place.
- **Thermal plate**  
The heatsink attachment plate.
- **Heat sink supports**  
The support pieces that are mounted on the mainboard to provide added support for heatsinks.

The L2 cache (TagRAM, PBSRAM) components keep standard industry names. The Pentium® II Processor is the first product to utilize the S.E.C. cartridge technology and Slot 1 connector. Unless otherwise noted, any references to “Pentium® II Processor,” “Pentium® II Processor/Slot 1 processor” or Processor” will apply to both the Pentium® II Processor desktop processors.

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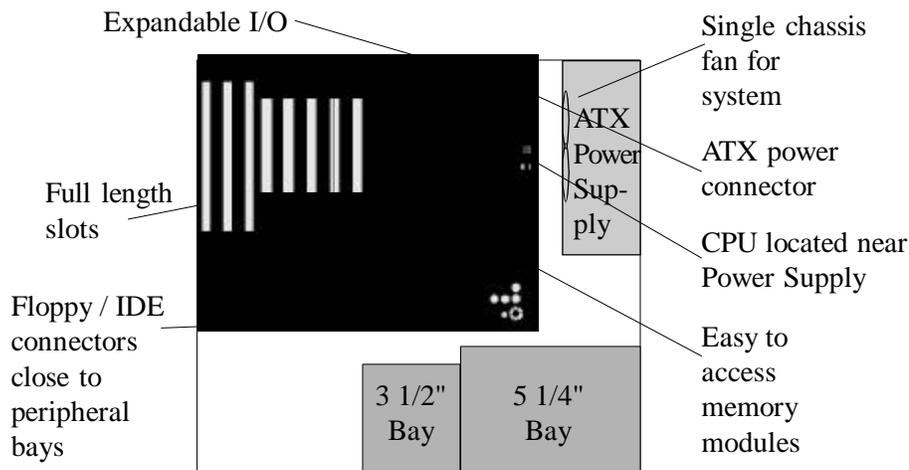
**1-2 KP6-FX 2 Specification**

- KP6-FX 2 is based on the Pentium® II Processor operating at 233 ~ 300 MHz on slot 1. The board is configured by an **Easy-Setting-Single-Jumper (ESSJ)** to match your CPU clock speed.
- Designed with Intel's 82440 FX PCIset
- Supports upto 1 GigaByte of DRAM (minimum of 8 MB) on board, You can use either 72-Pin SIMM x 4 or 168-Pin DIMM x 2 or both. It will automatically detect Fast Page Mode (FPM) DRAM or Extended Data Output (EDO) DRAM (please see page 2-7).
- KP6-FX 2 will support Error Checking and Correcting (ECC) when using parity DRAM modules. This will detect multiple bit errors and correct 1-bit memory errors.
- Supports (3) 16 bit ISA slots, (5) 32 bit PCI slots, and provides (2) independent high performance PCI IDE interfaces capable of supporting PIO Mode 3 and Mode 4 devices. The KP6-FX 2 supports (4) PCI Bus Master slots and a jumperless PCI INT# control scheme which reduces configuration confusion when plugging in PCI card(s).
- Supports ATAPI (e.g. CD-ROM) devices on both Primary and Secondary IDE interfaces.
- Designed with SMC 37C932FR Multi I/O: (1) floppy port, (1) parallel port (EPP, ECP), and (2) serial ports (16550 Fast UART).  
*Note: Japanese "Floppy 3 mode" is also supported*
- Includes a PS/2 mouse connector.
- Allows use of a PS/2 or AT keyboard.
- Features Award Plug & Play BIOS. With Flash Memory you can always upgrade to the current BIOS as they are released.
- Supports CPU Hardware sleep and SMM (System Management Mode).
- KP6-FX 2 utilizes a Lithium battery which provides environmental protection and longer battery life.
- Supports the Universal Serial Bus (USB) connector. The onboard PIIX chip provides the means for connecting PC peripherals such as monitors, keyboards, joysticks, telephones, and modems.
- Supports ATX 20 pin power supply connector.
- Supports Remote On/Off when used with ATX power supplies.
- Four Layer design technology and full ATX form factor.  
(12" x 9.6", 305mm X 244mm)
- Supports ring-in feature (remote power-on through external modem), allows system to be turned on remotely.
- Supports Desktop Management Interface (DMI) facilitating the management of desktop computers, hardware and software components and peripherals, whether they are standalone systems or linked into networks. (option)

**1-3 KP6-FX 2 Form-Factor Overview**

EPoX KP6-FX 2 is designed with ATX form factor - the latest industry standard of chassis. The ATX form factor is essentially a Baby-AT baseboard rotated 90 degrees within the chassis enclosure and a new mounting configuration for the power supply. With these changes the processor is relocated away from the expansion slots, allowing them all to hold full length add-in cards. ATX defines a double height aperture to the rear of the chassis which can be used to host a wide range of on-board I/O. Only the size and position of this aperture is defined, allowing PC manufacturers to add new I/O features (e.g.; TV input, TV output, joystick, modem, LAN, audio, etc.) to systems that will help them differentiate their products in the marketplace, and better meet your needs.

- By integrating more I/O down onto the board and better positioning the hard drive and floppy connectors material cost of cables and add-in cards is reduced.
- By reducing the number of cables and components in the system, manufacturing time and inventory holding costs are reduced and reliability will increase.
- By using an optimized power supply, it's possible to reduce cooling costs and lower acoustical noise. An ATX power supply, which has a side-mounted fan, allows direct cooling of the processor and add-in cards making a secondary fan or active heatsink unnecessary in most system applications.

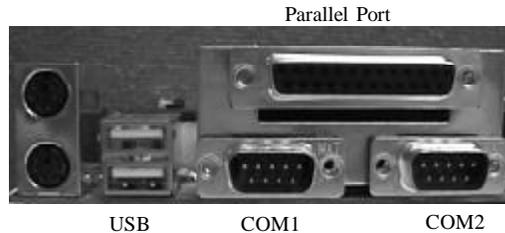


**Figure 1-2: Summary of ATX chassis features**

**1-3 I/O Shield Connector**

The **KP6-FX 2** is equipped with an I/O back panel. Please use the appropriate I/O shield. (refer to figure 1-3)

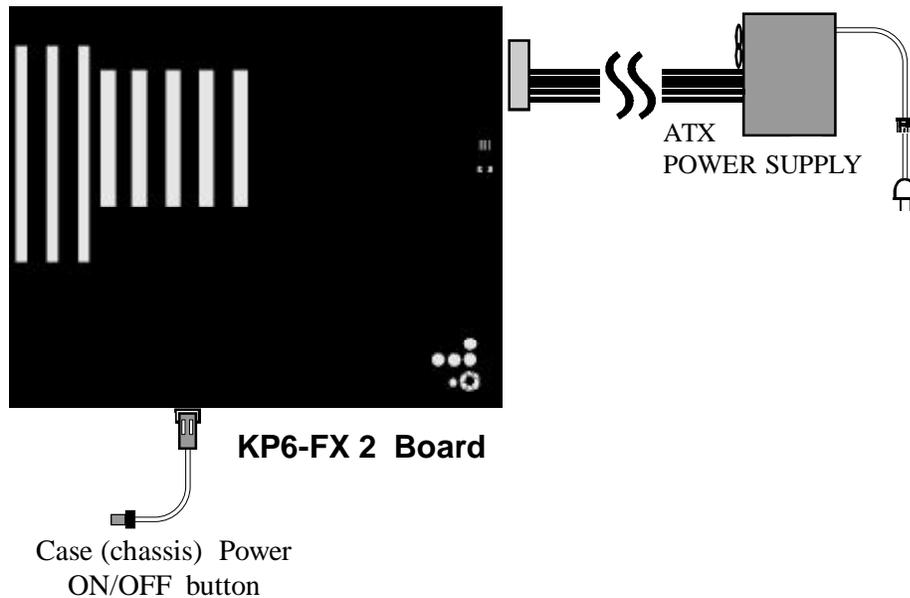
**Figure 1-3:**  
**KP6-FX 2**  
**I/O back**  
**panel Layout** PS/2 Mouse  
PS/2 Keyboard



**1-3.1 Power-On/Off (Remote)**

The **KP6-FX 2** has a single 20-PIN connector for ATX power supplies. For ATX power supplies that support the **Remote On/Off** feature, this should be connected to the systems front panel for system Power On/Off button. The systems power On/Off button should be a momentary button that is normally open.

The **KP6-FX 2** has been designed with "Soft Off" functions. You can turn Off the system from one of two sources: The first is the front panel Power On/Off button, and the other is the "Soft Off" function (coming from the KP6-FX 2's on-board circuit controller) that can be controlled by the the operating system. Windows 95 will control this when the user clicks is ready to Shutdown the system.



**Figure 3-3: Simple ATX Power ON/OFF Controller**

1-4 System Block Diagram

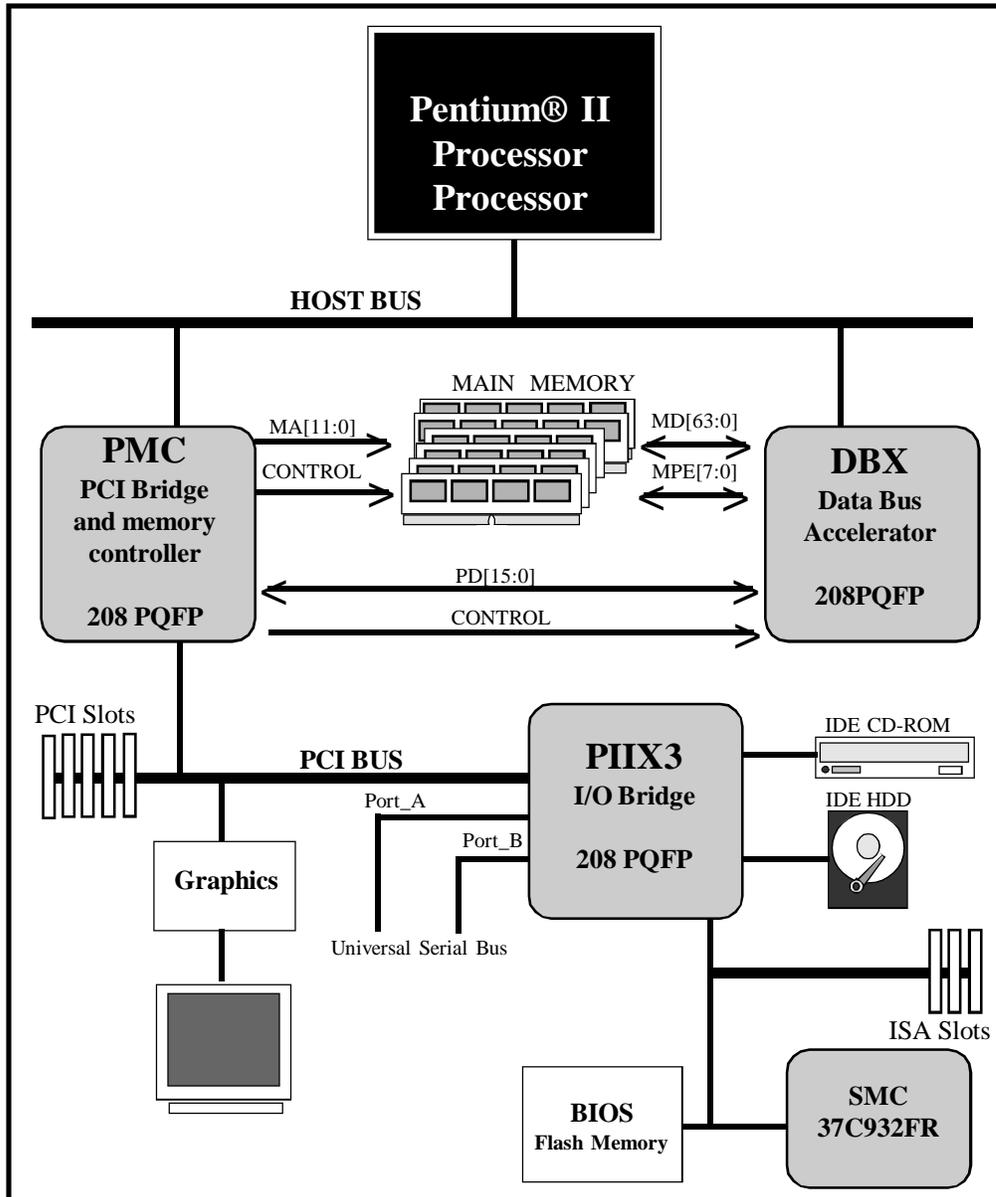


Figure 1-4 System Block Diagram

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# Installation

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## 2-1 KP6-FX 2 Layout

**The KP6-FX 2** is designed with Intel 82440FX PCIset chipset which is developed by Intel Corporation to fully support PCI/ISA systems. The Intel 82440FX PCIset chipset provides increased integration and improved performance. The chipset provides an integrated IDE controller with two high performance IDE interfaces for up to four IDE devices (hard drives, CD-ROM's, etc.). The SMC 37C932FR Super I/O controller provides the standard PC I/O function: floppy interface, two 16 Byte FIFO serial ports and EPP/ECP capable parallel port, keyboard controller, and RTC. The **KP6-FX 2** layout is shown in the next page ( Figure 2-1 ) for user's reference.

**Care must be taken** when inserting memory modules, inserting Pentium® II Processor or even plugging in a PCI card into associated slots to avoid damaging any circuits or sockets on board (Please unplug all power to the mainboard before installing any components). A high efficiency fan and heatsink fan is strongly recommended when installing a Pentium® II Processor to help prevent overheating.

**The KP6-FX 2** supports a minimum of 8MB of system memory and a maximum of 1GigaByte while the L2 Cache and cache controller are included in Pentium® II Processor CPU.

**The KP6-FX 2** supports standard Fast Page Mode (FPM) or Extended Data Out (EDO) memory. **The KP6-FX 2** provides four 72-pin SIMM sockets and two 168-pin DIMM sockets for memory modules. The 72-pin sockets (2 Banks) support 1M x 32 (4MB), 2M x 32 (8MB), 4M x 32 (16MB), 8M x 32 (32MB), 16M x 32 (64MB), and 32M x 32 (128MB) single-sided or double-sided memory modules and the 168-pin sockets (2 Banks) support 1M x 64 (8MB), 2M x 64 (32MB), 4M x 64 (64MB), 8M x 64 (128MB), 16M x 64 (256MB) single-sided or double-sided memory modules. The memory timing requires 60ns or 70ns FPM, EDO DRAM modules. Memory parity generation and checking or Error Checking and Correction (ECC) are supported [DRAM Modules may be parity (x 72) or ECC (x 72)]. The BIOS will automatically detect which DRAM is installed in the SIMM sockets.

**The KP6-FX 2** supports **Onboard two PCI IDE** connectors, these will be automatically detected by the BIOS to install your hard disk type at boot up.

**The KP6-FX 2** supports Award Plug & Play BIOS for ISA and PCI cards. The BIOS can be located in Flash memory. The advantage of having Flash memory is the ease of upgrading your BIOS to the current one with software.



**2-2 Connectors and Jumpers**

This section describes all of the connectors and jumpers built into the motherboard. The jumpers match Figure 2-1 on page 2-2

- J16** 1 

■
■

**Power On/Off**
  
- J9** + 

■
■
■
■
■
■
■
■

**IDE LED indicator** - LED ON when Onboard PCI IDE Hard disks activate
  
- + 

■
■

**Power Saving LED indicator** - LED ON when system is in any saving mode
  
- |   |
|---|
| ■ |
| ■ |

**Sleep/Resume switch** : Closed to enter sleep mode, a key-stroke or mouse movement will instantly "wake up".
  
- + 

■
■

**Turbo LED indicator** - LED ON when higher speed is selected
  
- + 

■
■

**Reset** - Closed to restart system.
  
- 1**

■
■
■
■

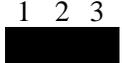
**Speaker** - connect to the system's speaker for beeping  
1. Speaker      3. GND  
2. N/C          4. GND
  
- 1**

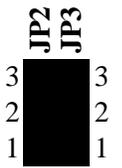
■
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**KeyLock** - Keyboard lock switch & Power LED connector  
1. Power LED(+)      4. Keylock  
2. N/C                  5. GND  
3. GND

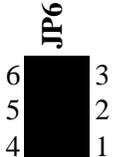
**2-2 Connectors and Jumpers (continued)**

Settings will match motherboard layout on Page 2-2

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

 **Flash Memory Voltage Select (Both JP2 & JP3)**  
 1-2 12V Flash memory  
 2-3 5V Flash memory. (Default)

**JP5**  **The Power Supply (+12V) for the CPU cooling fan.**

 **Memory Voltage Selection**  
 1-2 & 4-5 Reserved  
 2-3 & 5-6 3.3V DIMM module (Default)

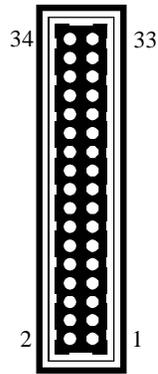
**J1**  **IrDA/ASK IR CONNECTOR:**  
 1. VCC  
 2. FIRRXX  
 3. IRRXX  
 4. GND  
 5. IRTX

**JP7**  **CPU Clock Rate Select (ESSJ)**  
 1-6 = 200 Mhz  
 2-7 = 233 Mhz (Default)  
 3-8 = 266 Mhz  
 3-8 & 5-10 = 300Mhz (PCB Rev. 0.2)  
 5-10 = Option

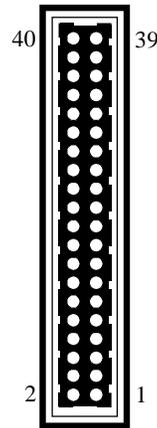
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**2-3 I/O Connectors**

**J17 Floppy Disk Connector**

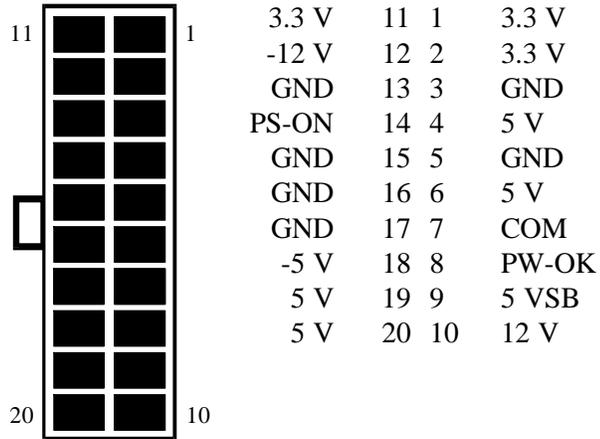


**J18,J19 Primary/Secondary IDE Connector**



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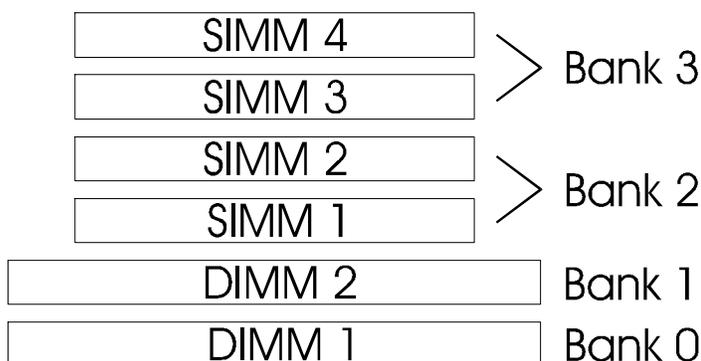
**2-3 I/O Connectors - continued**



*Note: The ATX power supply has to support 3.3 Volts Power*

**2-4 Memory Configurations**

The **KP6-FX 2** supports different type of settings for the system memory. There is no jumper nor connector needed for memory configuration. The following figure provides all possible memory combinations.



SIMM = 4MB, 8MB, 16MB, 32MB, 64MB, 128MB  
Fastpage or EDO mode SIMM

DIMM = 8MB, 16MB, 32MB, 64MB, 128MB, 512MB  
Fastpage or EDO mode DIMM (3.3 volt unbuffered recommended)

**NOTE :**

1. KP6-FX 2 supports and extends many memory configurations on its 4 SIMM & 2 DIMM sockets. The memory size of any configuration is very flexible. You can combine any configuration as you like. The BIOS will detect your memory configuration and size automatically, as long as you fill up a bank of memory.
2. KP6-FX 2 supports Fast Page Mode DRAM, EDO DRAM SIMMs, but they cannot be mixed within the same memory bank.
3. SIMMs/DIMMs may be parity (x 72) or non parity (x 64) or ECC (x 72).
4. The 60ns or 70ns Fast Page, EDO DRAM is necessary.
5. ONE “BANK” = 64 Bit = SIMM 1+ SIMM2 = SIMM 3+ SIMM 4  
= DIMM 1 = DIMM 2



### 3-1 STANDARD CMOS SETUP

Choose "STANDARD CMOS SETUP" in the CMOS SETUP UTILITY Menu (Fig.3-2). The STANDARD CMOS SETUP allows user to configure system settings such as the current date and time, type of hard disk drive installed, floppy drive type, and display type. Memory size is auto-detected by the BIOS and displayed for your reference. When a field is highlighted (use direction keys to move cursor and <Enter> key to select), the entries in the field will be changed by pressing <PgDn> or <PgUp> keys.

ROM PCI/ISA BIOS STANDARD CMOS SETUP AWARD SOFTWARE, INC									
Date (mm:dd:yy) : Tue, Jan 14, 1997									
Time (hh:mm:ss) : 14 : 30 : 50									
HARD DISK	TYPE	SIZE	CYLS	HEAD	PRECOMP	LANDZONE	SECTORE	MODE	
Primary Master	Auto	0	0	0	0	0	0	Auto	
Secondary Master	Auto	0	0	0	0	0	0	Auto	
Primary Slave	Auto	0	0	0	0	0	0	Auto	
Secondary Slave	Auto	0	0	0	0	0	0	Auto	
Drive A : 1.44, 3.5"					Base Memory : 640K				
Drive B : None					Extended Memory : 15360K				
Floppy 3 Mode Support : Disabled					Other Memory : 384K				
Video : EGA/VGA					Total : 16384K				
Halt On : All Errors									
ESC :	Quit	↑↓←→			:	Quit	PU/PD/+/-	:	Modify
F1 :	Help	(Shift) F2			:	Help			

**Figure 3-2 STANDARD CMOS SETUP**

**NOTE:** If hard disk Primary Master/Slave and Secondary Master/Slave were set to Auto, then the hard disk size and model will be auto-detected.

**NOTE:** The "Halt On :" field is to determine when to halt the system by the BIOS if error occurs.

### 3-2 BIOS FEATURES SETUP

Selecting the "BIOS FEATURES SETUP" option in the CMOS SETUP UTILITY menu allows users to change system related parameters in the displayed menu. This menu shows all of the manufacturer's default values of KP6-FX 2.

Pressing [F1] key to display help message of the selected item.  
 This provides the system a capability to recover from any possible error.

ROM PCI/ISA BIOS BIOS FEATURES SETUP AWARD SOFTWARE, INC.					
Virus Warning	: Disabled	Video BIOS	Shadow	:	Enabled
CPU Internal Cache	: Enabled	C8000-CBFFF	Shadow	:	Disabled
External Cache	: Enabled	CC000-CFFFF	Shadow	:	Disabled
Quick Power On Self Test	: 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	Esc : Quit	↑ ↓ → ← : Select Item		
PCI/VGA Palette Snoop	: Disable	F1 : Help	PU/PD/+/- : Modify		
OS Select For DRAM > 64MB	: Non-OS2	F5 : Old Values	(Shift)F2 : Color		
		F7 : Load Setup Defaults			

**Figure 3-3 BIOS FEATURES SETUP**

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

- Virus Warning:** This category flashes on the screen. During and after the system boots up, any attempt to write to the boot sector or partition table of the hard disk drive will halt the system and a error message will appear. You should then run an anti-virus program to locate the virus. Keep in mind that this feature protects only the boot sector, not the entire hard drive. Default value is Disabled

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

**Disabled:** No warning message to appear when anything attempts to access the boot sector.

*Note: Many disk diagnostic programs that access the boot sector table can trigger the virus warning message. If you plan to run such a program, we recommend that you first disable the virus warning.*

- **CPU Internal Cache / External Cache:** These two categories increase performance to memory access. The Pentium® II Processor CPU includes both Internal/External cache. The default value is Enable.  
*Note: If your Pentium® II Processor CPU is without External Cache then this item " External Cache" will not be shown.*  
**Enabled:** Enable cache.  
**Disable:** Disable 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. The default is Enabled.  
**Enabled:** Enable quick POST.  
**Disabled:** Normal POST.
- **Boot Sequence:** This category determines which drive is searched first for the O/S (Operating System). Default value is A,C,SCSI. The following is your list of options.  
[A, C, SCSI] - [C, A, SCSI] - [C, CDROM, A] - [CDROM, C, A] - [D, A, CDROM]  
[E, A, CDROM] - [F, A, CDROM] - [SCSI, A, C] - [SCSI C, A] - [C Only]
- **Swap Floppy Drive:** This will swap your physical drive letters A & B if you are using two floppy disks. Default value is Disabled.  
**Enabled:** Floppy A & B will be swapped under the O/S.  
**Disabled:** Floppy A & B will be not swap.
- **Boot Up Floppy Seek:** During Power-On-Self-Test (POST), BIOS will determine if the floppy disk drive installed is 40 or 80 tracks. Only 360K type is 40 tracks while 760K, 1.2M and 1.44M are all 80 tracks. The default value is Enabled.  
**Enabled:** BIOS searches for floppy disk drive to determine if it is 40 or 80 tracks, Note that BIOS can not tell from 720K, 1.2M or 1.44M drive type as they are all 80 tracks.  
**Disabled:** BIOS will not search for the type of floppy disk drive by track number.
- **Boot Up NumLock Status:** Control the state of the NumLock key when the system boots. The default value is On.  
**On:** Keypad is number keys.  
**Off:** Keypad is arrow keys.
- **Boot UP System Speed:** Select High to boot at the default CPU speed; select Low to boot at the speed of the AT bus.  
**High:** Set the speed to high.  
**Low:** Set the speed to low.

- **Gate A20 Option:** This refers to the way the system addresses memory above 1MB (extended memory). The default value is Fast.

*Normal:* The A20 signal is controlled by keyboard controller or chipset hardware.

*Fast:* The A20 signal is controlled by Port 92 or chipset specific method.
- **Typematic Rate Setting:** This determines the keystrokes repeat rate.

*Enabled:* Enable typematic rate and typematic delay programming.

*Disabled:* Disable typematic rate and typematic delay programming. The rate will be controlled by keyboard controller in your system.
- **Typematic Rate(Chars/Sec):**

6 : 6 characters per second.	8 : 8 characters per second.
10: 10 characters per second.	12: 12 characters per second.
15: 15 characters per second.	20: 20 characters per second.
24: 24 characters per second.	30: 30 characters per second.
- **Typematic Delay(Msec):** When holding a key, the time between the first and second character displayed.

250 : 250 msec.
500 : 500 msec.
750 : 750 msec.
1000: 1000 msec.
- **Security Option:** This category allows you to limit access to the system and Setup, or just to Setup. The default value is Setup.

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

*Setup:* The system will boot; but the access to Setup will be denied if the incorrect password is not entered at the prompt.
- **PCI/VGA Palette Snoop:** This filed controls the ability of a primary PCI VGA controller to share a common palette (When a snoop write cycles) with an ISA video card. The default value is Disabled.

*Enabled:* If an ISA card connects to a PCI VGA card via the VESA connector and that ISA card connects to VGA monitor and that ISA card uses the RAMDAC of PCI card.

*Disabled:* Disable the VGA card Palette snoop function.
- **Video BIOS Shadow:** It determines whether video BIOS will be copied to RAM, however it is optional from chipset design. Video Shadow will increase the video speed.

*Enabled:* Video shadow is enabled.

**Disabled:** Video shadow is disabled.

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

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

**Enabled:** Optional shadow is enabled.

**Disabled:** Optional shadow is disabled.

**3-3 CHIPSET FEATURES SETUP**

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

ROM PCI/ISA BIOS CHIPSET FEATURES SETUP AWARD SOFTWARE, INC.			
Auto Configuration	: Enabled	8 Bit I/O Recovery Time	: 1
DRAM Speed Selection	: 60ns	16 Bit I/O Recovery Time	: 1
DRAM RAS# Precharge Time	: 4	Memory Hole AT 15M-16M	: Disabled
MA Additional Wait state	: Disabled	DRAM Fast Leadoff	: Disabled
RAS# To Cas# Delay	: Disabled	Passive Release	: Enabled
DRAM Read Burst (B/E/F)	: 2/2/3	Delayed Transaction	: Disabled
DRAM Write Burst (B/E/F)	: 2/2/3		
ISA Bus Clock	: PCICLK/4		
DRAM Refresh Queue	: Enabled		
DRAM RAS Only Refresh	: Disabled		
DRAM ECC/PARITY Select	: Disabled		
Fast Dram Refresh	: Disabled		
Read-Around-Write	: Enabled		
PCI Burst Write Combine	: Enabled		
PCI-To-DRAM Pipeline	: Enabled		
CPU-To-PCI Write Post	: Enabled		
CPU-To-PCI IDE Posting	: Enabled		
System BIOS Cacheable	: Disabled		
Video RAM Cacheable	: Disabled		

Esc : Quit	↑ ↓ → ← : Select Item
F1 : Help	PU/PD/+/- : Modify
F5 : Old Values	(Shift)F2 : Color
F7 : Load Setup Defaults	

**Figure 3-4 CHIPSET FEATURES SETUP**

- **Auto Configuration:** Selects predetermined optimal 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.*

- **DRAM Speed Selection:** This value must correspond to the speed of the DRAM installed in your system. DO NOT change the default setting of this field, as determined by the system board manufacturer for the installed DRAM. This value is access speed, so a lower value means a faster system. The default value is 60ns.

*60ns:* (Faster) Burst Wait State, for 60~70ns Fast Page Mode/EDO DRAM.

*70ns:* (Slower) Burst Wait State, for 70ns Fast Page Mode/EDO DRAM.
- **DRAM RAS# Precharge Time:** The precharge time is the number of cycles. It takes for the RAS to accumulate its charge before DRAM refresh. If insufficient time is allowed, refresh may be complete and the DRAM may fail to retain data. The default value is 3.

*3:* Time equals 3 host clocks.

*4:* Time equals 4 host clocks.
- **MA Additional Wait State:** This allows the option to insert an additional wait state before the beginning of a memory read. The default value is Disabled.

*Enabled:* One additional wait state is inserted before the assertion of the first M<sub>Axx</sub> and CAS<sub>x#</sub>/RAS<sub>x#</sub> assertion during DRAM read or write lead off cycles.

*Disabled:* No extra wait state for M<sub>Axx</sub> and CAS<sub>x#</sub>/RAS<sub>x#</sub>.
- **RAS# to CAS# Delay:** Allows you to insert a timing delay between the CAS and RAS strobe signals, used when DRAM is written to, read from, or refreshed. The default value is Enabled.

*Enabled:* Adds one clock between the assertion of RAS# and CAS#. (Better stability of the system)

*Disabled:* No delay between the assertion of RAS# and CAS#. (Faster Performance)
- **DRAM Read/Write Burst (B/E/F):** The default value is x2/2/3.

This field indicates the EDO/FPM(B/E/F) DRAM system Read/Write burst mode. The value x2/2/3 stands for EDO(x222) or FPM(x333) respectively.
- **ISA Bus Clock:** Set the speed of the ISA bus here. The default value is PCICLK/4.

*PCICLK/4:* If the system is operating at 60/66MHz, then the PCICLK is 30/33MHz.

*PCICLK/3:* The system is operating at 50MHz, than PCICLK is 25MHz.

- **DRAM RAS Only Refresh:** Permits queuing up to four DRAM refresh requests, so DRAM can refresh at optimal times. The default value is Disabled.  
*Enabled:* The DRAM Refresh type is RAS only.  
*Disabled:* The DRAM Refresh type is CAS before RAS.
- **ECC Checking/Generation:** The default value is Enabled.  
*ECC:* This field is enabled the optional DRAM Error Checking and Correction (ECC) with 72-bit Wide memory.  
*Parity:* This field is enabled the optional DRAM parity Error with 72-bits wide memroy  
*Disabled:* Disabled the ECC parity function.
- **Fast DRAM Refresh:** The cache DRAM controller offers two refresh modes, Normal and Hidden. In both modes, CAS takes place before RAS but the Normal mode requires a CPU cycle for each. On the other hand, a cycle is eliminated by “hiding” the CAS refresh in Hidden mode. Not only is the Hidden mode faster and more efficient, but it also allows the CPU to maintain the status of the cache even if the system goes into a power management “suspend” mode.  
*Enabled:* Hidden Mode  
*Disabled:* Normal Mode
- **Read-Around-Write:** DRAM optimization feature (Default is Enabled)  
*Enabled:* 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.  
*Disabled:* Memory read is addressed to a location on whose write through to memory.
- **PCI Burst Write Combine:**  
*Enabled:* Chipset assembles long PCI bursts from the data held in these buffers.  
*Disabled:* The chipset doesn't assemble long PCI bursts from the data held in these buffers
- **PCI-To-DRAM Pipeline:** DRAM optimization feature:  
*Enabled:* full PCI-to-DRAM write pipelining is enabled. Buffers in the chipset store data written from the PCI bus to memory.  
*Disabled:* When Disabled, PCI writes to DRAM are limited to a single transfer per write cycle.

- **CPU-To-PCI Write Post:**
  - Enabled:* Writes from the CPU to the PCI bus are buffered, to compensate for the speed differences between the CPU and the PCI bus.
  - Disabled:* The writes are not buffered and the CPU must wait until the write is complete before starting another write cycle.
- **CPU-To-PCI IDE Posting:**
  - Enabled:* To post write cycles from the CPU to the PCI IDE interface. IDE accesses are posted in the CPU to PCI buffers, for cycle optimization.
  - Disabled:* Doesn't post write cycles from the CPU to the PCI buffers.
- **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 BIOS Cacheable:** Allows caching of the video BIOS ROM at C0000h to C7FFFh, resulting in better video performance. The default value is Enabled.
  - Enabled:* Enables the Video BIOS Cacheable to speed up the VGA Performance.
  - Disabled:* Will not use the Video BIOS Cacheable function.
- **8/16 Bit I/O Recovery Time:** The default value is 1.
  - 8 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.
  - Disabled:* Normal Setting.
  - Enabled :* This field enables the main memory (15~16MB) remap to ISA BUS.
- **DRAM Fast Landoff:** Shorten the leadoff cycles to optimize performance.
- **Passive Release:** The default value is enabled
- **Delayed Transaction:** The default value is disabled.

### 3-4 POWER MANAGEMENT SETUP

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

ROM PCI/ISA BIOS POWER MANAGEMENT SETUP AWARD SOFTWARE, INC.		
Power Management	: User Define	** Power Down & Resume Events **
PM Control by APM	: Yes	IRQ3 (COM 2) : ON
Video off Method	: V/H SYNC+Blank	IRQ4 (COM 1) : ON
Modem Use IRQ	: 3	IRQ5 (LPT 2) : ON
Doze Mode	: Disable	IRQ6 (Floppy Disk) : ON
Standby Mode	: Disable	IRQ7 (LPT 1) : OFF
Suspend Mode	: Disable	IRQ8 (RTC Alarm) : OFF
HDD Power Down	: 15min	IRQ9 (IRQ2 Redir) : ON
** Wake Up Events In Doze & Standby **		IRQ10 (Reserved) : ON
IRQ3 (Wake-Up Event)	: ON	IRQ11 (Reserved) : ON
IRQ4 (Wake-Up Event)	: ON	IRQ12 (PS/2 Mouse) : ON
IRQ8 (Wake-Up Event)	: ON	IRQ13 (Coprocessor) : ON
IRQ12 (Wake-Up Event)	: ON	IRQ14 (Hard Disk) : ON
		IRQ15 (Reserved0) : OFF
		Esc : Quit                   ↑ ↓                   : Select Item
		F1 : Help                   PU/PD/+/- : Modify
		F5 : Old Values           (Shift)F2 : Color
		F7 : Load Setup Defaults

**Figure 3-5 POWER MANAGEMENT SETUP**

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

#### 3-3-1 The Description of the Power Management (PM)

##### A. Power Management mode selection:

- Disabled:** The system operates in NORMAL conditions (Non-GREEN), and the Power Management function is disabled.
- Max. saving:** Maximum power savings. Inactivity period is 1 minute in each mode.
- Min. saving:** Minimum power savings. Inactivity period is 1 minute in each mode.
- User define:** Allow user to define PM Timers parameters to control power saving mode.

**B. Time-out parameters:****System Doze**

The "System Doze" mode timer starts to count when there is no "PM events" occurred. The valid time-out setting is from 1 minute up to 1 hour.

**System Standby**

The "Standby" mode timer starts to count when "System Doze" mode timer timed out and no "PM events" occurred. Valid range is from 1 minute up to 1 hour.

**System Suspend**

This function works only when the Pentium® Pro Processor is installed. The timer starts to count when "System Standby" mode timer is timed out and no "PM Events" occurred. Valid range is from 1 minute up to 1 hour.

**HDD Power Down**

HDD Standby timer can be set from 1 to 15 minute(s).

**3-3-2 Description of the Green Functions**

- **PM Control by APM:**

If Advanced Power Management (APM) is installed on your system, selecting *Yes* gives better power savings.

- **Video Off Method:** Determines the manner in which the monitor is blanked.

**V/H SYNC+Blank:**

System turns off vertical and horizontal synchronization ports and writes blanks to the video buffer.

**DPMS Support:**

Select this option if your monitor supports the Display Power Management Signaling (DPMS) standard of the Video Electronics Standards Association (VESA). Use the software supplied for your video subsystem to select video power management values.

**Blank Screen:**

System only writes blanks to the video buffer.

- **MODEM Use IRQ:** Default value is IRQ 3

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

The KP6-FX 2 supports HDD Power Down, Doze and Standby power saving functions when using Intel Pentium® II Processor.

**Doze Mode**

The system hardware will drop down CPU clock from normal working speed when Doze mode time-out occurs.

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**Standby Mode**

When the system standby mode timer times-out, it will enter the standby mode and retain CPU at slow working speed. The screen will be blanked out.

**Suspend Mode**

When the system suspend timer times-out, the system will enter the suspend mode and the chipset will stop CPU clock immediately. The power consumption in Suspend Mode is lower than in standby mode. The screen is also blanked out.

**HDD Standby Mode**

When system stop reading or writing HDD, the timer starts to count. The system will cut off the HDD power when timer runs out of time. The system will not resume operation until either a read from or a write to HDD command is executed again.

**Wake Up Events**

When the system is in Doze, suspend or Standby mode, you may disable activity monitoring of some common interrupt requests so they do not wake up the system.

The default wake-up event is keyboard activity. In these wake-up event fields, you can turn *On* or *Off* four commonly used interrupts. For example, if you have a modem on IRQ3, you can turn *On* IRQ3 as a wake-up event, so an interrupt from the modem can wake up the system. Or you may wish to turn *Off* IRQ12 (the PS/2) mouse as a wake-up event, so accidentally brushing the mouse does not awaken the system.

**Power Down and Resume Events**

You may disable monitoring of common interrupt requests so they do not reset activity timers.

IRQ3 (COM 2 )	IRQ9 (IRQ2 Redir)
IRQ4 (COM 1)	IRQ10 (Reserved)
IRQ5 (LPT 2)	IRQ11 (Reserved)
IRQ6 (Floppy Disk)	IRQ12 (PS/2 Mouse)
IRQ7 (LPT 1)	IRQ13 (Coprocessor)
IRQ8 (RTC Alarm)	IRQ14 (Hard Disk)
	IRQ15 (Reserved)

### 3-5 PNP/PCI CONFIGURATION

The PNP/PCI configuration program is for the user to modify the PCI/ISA IRQ signals when various PCI/ISA cards are inserted in the PCI or ISA slots.

**WARNING:** *Conflicting IRQ's may cause the system to not find certain devices.*

ROM PCI/ISA BIOS PNP/PCI CONFIGURATION AWARD SOFTWARE, INC.	
Resources Controlled By: Manual	PCI IRQ Activated By : Level
Reset Configuration Data : Disabled	PCI IDE IRQ Map To : PCI-AUTO
IRQ-3 assigned to : Legacy ISA	Primary IDE INT# : A
IRQ-4 assigned to : Legacy ISA	Secondary IDE INT# : B
IRQ-5 assigned to : PCI/ISA PnP	Used MEM base addr : N/A
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	Esc : Quit      ↑ ↓ → ← : Select Item
DMA-1 assigned to : PCI/ISA PnP	F1 : Help      PU/PD/+/- : Modify
DMA-3 assigned to : PCI/ISA PnP	F5 : Old Values      (Shift)F2 : Color
DMA-5 assigned to : PCI/ISA PnP	F7 : Load Setup Defaults
DMA-6 assigned to : PCI/ISA PnP	
DMA-7 assigned to : PCI/ISA PnP	

**Figure 3-6 PCI CONFIGURATION SETUP**

- Resource 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 resource automatically.
- Reset Configuration Data:** The default value is Disabled

**Disabled:** Normal Setting

**Enabled:** If you had plugged some Legacy cards in the system and they 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 any thing here in the **SETUP** program. However, if you do not know whether you have true PCI card or not, please refer to your PCI card user's manual for the details. When you have a Legacy card (described in section 3-6) to be plugged into the system, a proper setting is extremely important or it may cause the system hang. The diagram shown below tells you how the Rotating Priority Mechanism is designed.

- Used MEM base addr and Used MEM Length:** 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 the some specific ISA Legacy cards with requested memory space below 1M address. Now with these two funtions, users canm define where the used memory address is located and its length of the legacy area that is used by the legacy device to avoid the 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 D000H-D3FFFH is occupied by ISA legacy cards, and thus BIOS will not assign this region for PnP/ISA and PCI cards.

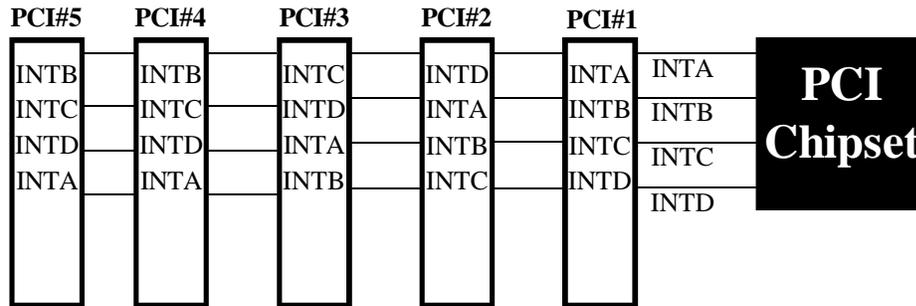


Figure 3-7 The Combination of PCI INT# lines

### 3-6 INTEGRATED PERIPHERALS

ROM PCI/ISA BIOS INTEGRATED PERIPHERALS WARD SOFTWARE, INC.			
IDE HDD Block Mode	: Enabled	USB Controller	: Disabled
IDE Primary Master PIO	: Auto	USB Keyboard Support *	: Disabled
IDE Primary Slave PIO	: Auto		
IDE Secondary Master PIO	: Auto		
IDE Secondary Slave PIO	: Auto		
Onboard Primary PCI IDE	: Enabled		
Onboard Secondary PCI IDE	: Enabled		
PCI Slot IDE 2nd Channel	: Enabled		
Onboard FDC Controller	: Enabled		
Onboard UART Port 1	: Auto		
Onboard UART Port 2	: Auto		
UART 2 Mode	: Standard		
Onboard Parallel Port	: 378/IRQ7		
Parallel Port Mode	: ECP+EPP1.9		
ECP Mode Use DMA	: 3		
		* Only visible when USB is Enabled	
		Esc : Quit	↑ ↓ ← → : Select Item
		F1 : Help	PU/PD/+/- : Modify
		F5 : Old Values	(Shift)F2 : Color
		F7 : Load Setup Defaults	

Figure 3-8 INTEGRATED PERIPHERALS

*Note: If you do not use the Onboard IDE connector, then you will need set Onboard Primary PCI IDE: Disabled and Onboard Secondary PCI IDE: Disabled from CHIPSET FEATURES SETUP UTILITY. The Onboard PCI IDE cable should be equal to or less than 18 inches (45 cm.).*

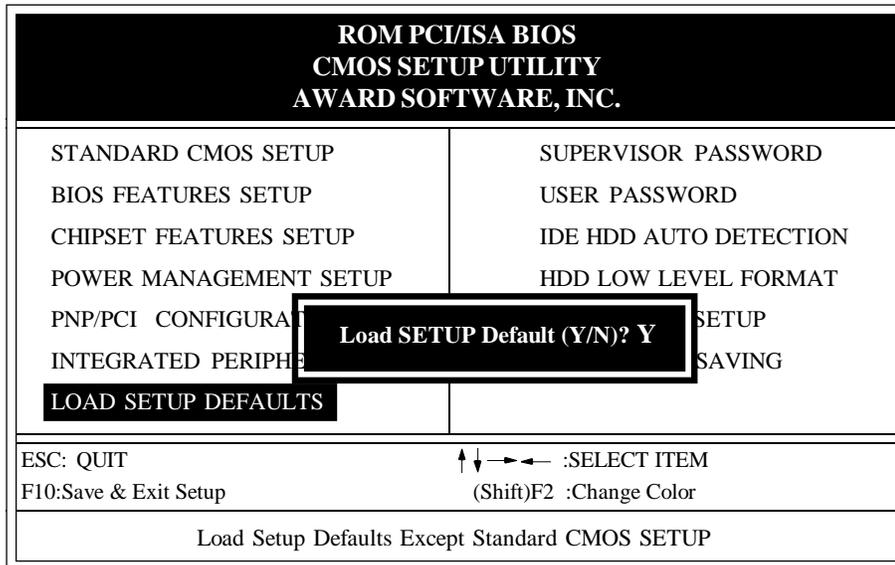
- **IDE HDD Block Mode:** Select Enabled only if your hard drives support block mode.  
*Enabled:* Enabled IDE HDD Block Mode. Provides higher HDD transfer rates.  
*Disabled:* Disable IDE HDD Block Mode.
- **PCI Slot IDE 2nd Channel:** The default value is Enabled.  
*Enabled:* Enable secondary IDE port and BIOS will assign IRQ15 for this port.  
*Disabled:* Disable secondary IDE port and IRQ15 is available for other device.
- **Onboard Primary PCI IDE:** The default value is Enabled.  
*Enabled:* Enables Onboard IDE primary port.  
*Disabled:* Disables Onboard IDE primary port.
- **Onboard Secondary PCI IDE:** The default value is Enabled.  
*Enabled:* Enables Onboard IDE secondary port.  
*Disabled:* Disables Onboard IDE secondary port.
- **IDE Primary Master PIO:** The default value is Auto.  
*Auto:* BIOS will automatically detect the Onboard Primary Master PCI IDE HDD Accessing mode.  
*Mode 0~4:* Manually set the IDE Accessing mode.
- **IDE Primary Slave PIO:** The default value is Auto.  
*Auto:* BIOS will automatically detect the Onboard Primary Slave PCI IDE HDD Accessing mode.  
*Mode 0~4:* Manually set the IDE Accessing mode.
- **IDE Secondary Master PIO:** The default value is Auto.  
*Auto:* BIOS will automatically detect the Onboard Secondary Master PCI IDE HDD Accessing mode.  
*Mode 0~4:* Manually set the IDE Accessing mode.
- **IDE Secondary Slave PIO:** The default value is Auto.  
*Auto:* BIOS will automatically detect the Onboard Secondary Slave PCI IDE HDD Accessing mode.  
*Mode 0~4:* Manually set the IDE Accessing mode.

- **Onboard FDC Controller:** The default value is Enabled.  
*Enabled:* Enable the Onboard SMC CHIP's floppy drive interface controller.  
*Disabled:* Disable the Onboard SMC CHIP's floppy drive interface controller.
- **Onboard Serial Port 1:** This field allows the user to select the serial port. The default value is Auto.  
*AUTO:* Enable Onboard Serial port 1 and address is Auto adjusted  
*COM1:* Enable Onboard Serial port 1 and address is 3F8H/IRQ4.  
*COM2:* Enable Onboard Serial port 1 and address is 2F8H/IRQ3.  
*COM3:* Enable Onboard Serial port 1 and address is 3E8H/IRQ4.  
*COM4:* Enable Onboard Serial port 1 and address is 2E8H/IRQ3.  
*Disabled:* Disable Onboard SMC CHIP's Serial port 1.
- **Onboard UART 2:** This field allows the user to select the serial port. The default value is Auto.  
*AUTO:* Enable Onboard Serial port 2 and address is Auto adjusted  
*COM1:* Enable Onboard Serial port 2 and address is 3F8H/IRQ4.  
*COM2:* Enable Onboard Serial port 2 and address is 2F8H/IRQ3.  
*COM3:* Enable Onboard Serial port 2 and address is 3E8H/IRQ4.  
*COM4:* Enable Onboard Serial port 2 and address is 2E8H/IRQ3.  
*Disabled:* Disable Onboard SMC CHIP's Serial port 2.
- **Onboard UART 2 Mode:** The default value is standard. This field allows the user to select the COM2 port that can support a serial Infrared Interface.  
*Standard:* Support a Serial Infrared Interface IrDA.  
*IrDA:* Support a Serial Infrared Interface format.  
*ASKIR:* Support a Sharp Serial Infrared Interface format.
- **Onboard Parallel port:** This field allows the user to select the LPT port. The default value is 378H/IRQ7.  
*378H:* Enable Onboard LPT port and address is 378H and IRQ7  
*278H:* Enable Onboard LPT port and address is 278H and IRQ5.  
*3BCH:* Enable Onboard LPT port and address is 3BCH and IRQ7.  
*Disabled:* Disable Onboard SMC CHIP's LPT port.
- **Parallel Port Mode:** This field allows the user to select the parallel port mode. The default value is ECP+EPP.  
*Normal:* Standard mode. IBM PC/AT Compatible bidirectional parallel port.  
*EPP:* Enhanced Parallel Port mode.  
*ECP:* Extended Capabilities Port mode.  
*EPP+ECP:* ECP Mode & EPP Mode.

- ECP Mode USE DMA:** This field allows the user to select DMA1 or DMA3 for the ECP mode. The default value is DMA3.  
**DMA1:** The field selects the routing of DMA1 for the ECP mode.  
**DMA3:** The field selects the routing of DMA3 for the ECP mode.

### 3-7 LOAD SETUP DEFAULTS

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



**Figure 3-10 LOAD SETUP DEFAULT**

### 3-8 CHANGE SUPERVISOR or USER PASSWORD

To change the password, choose the "SUPERVISOR PASSWORD or USER PASSWORD" option from the CMOS SETUP UTILITY menu and press [Enter].

**NOTE:** Either "Setup" or "System" must be selected in the "Security Option" of the BIOS FEATURES SETUP menu (Refer to Figure 4-3 for the details).

- If CMOS is corrupted or the option was not used, a default password stored in the ROM will be used. The screen will display the following message:

Enter Password:

Press the [Enter] key to continue after proper password is given.

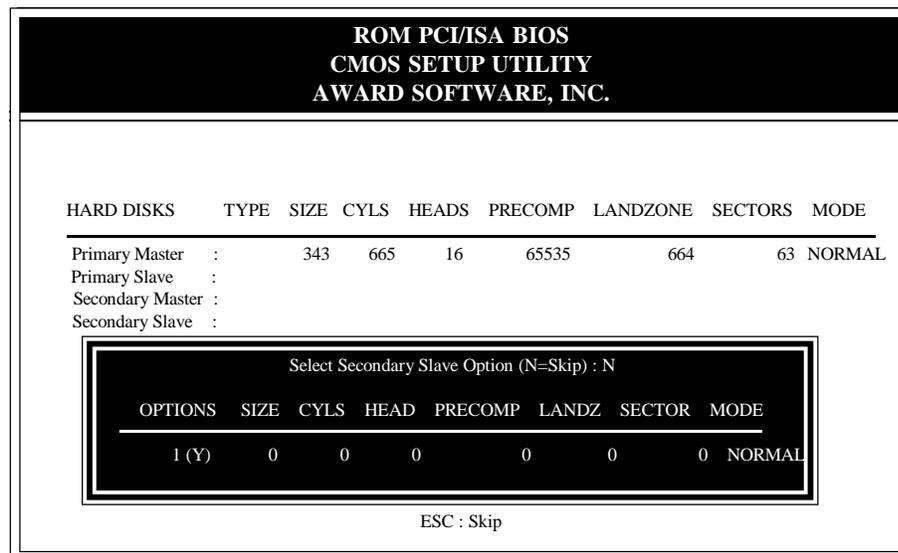
2. If CMOS is corrupted or the option was used earlier and the user wish to change default password, the **SETUP UTILITY** will display a message and ask for a confirmation.

Confirm Password:

3. After pressing the [Enter] key (ROM password if the option was not used) or current password (user-defined password), the user can change the password and store new one in CMOS RAM. A maximum of 8 characters can be entered.

### 3-9 IDE HDD AUTO DETECTION

The "IDE HDD AUTO DETECTION" utility is a very useful tool especially when you do not know which kind of hard disk type you are using. You can use this utility to detect the correct disk type installed in the system automatically. **But now** you can set **HARD DISK TYPE** to **Auto** in the **STANDARD CMOS SETUP**. You don't need the "IDE HDD AUTO DETECTION" utility. The BIOS will Auto-detect the hard disk size and model on display during POST.



**Figure 3-9 IDE HDD AUTO DETECTION**

#### **NOTE: HDD Modes**

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

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

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

no. Cylinder	(1024)
x no. Head	( 16)
x no. Sector	( 63)
<u>x no. per sector</u>	<u>( 512)</u>
	528 Megabytes

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

**LBA (Logical Block Addressing) mode:**

A new HDD accessing method to overcome the 528 Megabyte bottleneck.

The number of cylinders, heads & sectors shown in setup may not be the number physically contained in the HDD. During HDD accessing, the IDE controller will transform the logical address described by sector, head & cylinder into its own physical address inside the HDD. The maximum HDD size supported by LBA mode is 8.4 GigaBytes which is obtained by the following formula:

no. Cylinder	(1024)
x no. Head	( 255)
x no. Sector	( 63)
<u>x bytes per sector</u>	<u>( 512)</u>
	8.4 GigaBytes

**LARGE mode:**

Extended HDD access mode supported by Award Software.

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

<u>CYLS</u>	<u>HEADS</u>	<u>SECTOR</u>	<u>MODE</u>
1120	16	59	NORMAL
560	32	59	LARGE

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

**Maximum HDD size:**

no. Cylinder	(1024)
x no. Head	( 32)
x no. Sector	( 63)
<u>x bytes per sector</u>	<u>( 512)</u>

1 GigaByte

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

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

**3-10 HDD LOW LEVEL FORMAT****Interleave:**

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

**3-11 SAVE & EXIT SETUP**

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

**3-12 EXIT WITHOUT SAVING**

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

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# Appendix A:

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## A-1 MEMORY MAP

Address Range	Size	Description
[00000-7FFFF]	512K	Conventional memory
[80000-9FBFF]	127K	Extended Conventional memory
[9FC00-9FFFF]	1K	Extended BIOS data area if PS/2 mouse is installed
[A0000-C7FFF]	160K	Available for Hi DOS memory
[C8000-DFFFF]	96K	Available for Hi DOS memory and adapter ROMs
[E0000-EEFFF]	60K	Available for UMB
[EF000-EFFFF]	4K	Video service routine for Monochrome & CGA adaptor
[F0000-F7FFF]	32K	BIOS CMOS setup utility
[F8000-FCFFF]	20K	BIOS runtime service routine (2)
[FD000-FDFFF]	4K	Plug and Play ESCD data area
[FE000-FFFFF]	8K	BIOS runtime service routine (1)

## A-2 I/O MAP

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

**A-3 TIME & DMA CHANNELS MAP****TIME MAP:**

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

**DMA CHANNELS:**

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

**A-4 INTERRUPT MAP****NMI :**

Parity check error.

**IRQ (H/W):**

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

**A-5 RTC & CMOS RAM MAP****RTC & CMOS:**

00	Seconds.
01	Second 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.
34-3F	Reserve.
40-7F	Reserved for CHIPSET SETTING DATA.

# Appendix B:

## B POST CODES

ISA POST codes are typically output to I/O port address 80h.

POST(hex)	DESCRIPTION
<b>01-02</b>	Reserved.
<b>C0</b>	Turn off OEM specific cache, shadow.
<b>03</b>	<ol style="list-style-type: none"> <li>1. Initialize EISA registers (EISA BIOS only).</li> <li>2. Initialize all the standard devices with default values</li> </ol> Standard devices includes. <ul style="list-style-type: none"> <li>-DMA controller (8237).</li> <li>-Programmable Interrupt Controller (8259).</li> <li>-Programmable Interval Timer (8254).</li> <li>-RTC chip.</li> </ul>
<b>04</b>	Reserved
<b>05</b>	1. Keyboard Controller Self-Test.
<b>06</b>	2. Enable Keyboard Interface.
<b>07</b>	Reserved.
<b>08</b>	Verifies CMOS's basic R/W functionality.
<b>C1</b>	Auto-detection of onboard DRAM & Cache.
<b>C5</b>	Copy the BIOS from ROM into E0000-FFFFFF shadow RAM so that POST will go faster.
<b>08</b>	Test the first 256K DRAM.
<b>09</b>	OEM specific cache initialization. (if needed)
<b>0A</b>	<ol style="list-style-type: none"> <li>1. Initialize the first 32 interrupt vectors with corresponding Interrupt handlers. Initialize INT no from 33-120 with Dummy (Suprious) Interrupt Handler.</li> <li>2. Issue CUID instruction to identify CPU type.</li> <li>3. Early Power Management initialization. (OEM specific)</li> </ol>
<b>0B</b>	<ol style="list-style-type: none"> <li>1. Verify the RTC time is valid or not.</li> <li>2. Detect bad battery.</li> <li>3. Read CMOS data into BIOS stack area.</li> <li>4. PnP initializations including. (PnP BIOS only)               <ul style="list-style-type: none"> <li>- Assign CSN to PnP ISA card.</li> <li>- Create resource map from ESCD.</li> </ul> </li> <li>5. Assign IO &amp; Memory for PCI devices. (PCI BIOS only)</li> </ol>
<b>0C</b>	Initialization of the BIOS Data Area. (40:0N - 40:FF)

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0D	<ol style="list-style-type: none"><li>1. Program some of the Chipset's value according to Setup. (Early Setup Value Program)</li><li>2. Measure CPU speed for display &amp; decide the system clock speed.</li><li>3. Video initialization including Monochrome, CGA, EGA/VGA. If no display device found, the speaker will beep.</li></ol>
0E	<ol style="list-style-type: none"><li>1. Test video RAM. (If Monochrome display device found)</li><li>2. Show messages including.<ul style="list-style-type: none"><li>- Award Logo, Copyright string, BIOS Data code &amp; Part No.</li><li>- OEM specific sign on messages.</li><li>- Energy Star Logo. (Green BIOS ONLY)</li><li>- CPU brand, type &amp; speed.</li><li>- Test system BIOS checksum. (Non-Compress Version only)</li></ul></li></ol>
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. (EISA BIOS only)
1F-29	Reserved.
30	Detect Base Memory & Extended Memory Size.
31	<ol style="list-style-type: none"><li>1. Test Base Memory from 256K to 640K.</li><li>2. Test Extended Memory from 1M to the top of memory.</li></ol>
32	<ol style="list-style-type: none"><li>1. Display the Award Plug &amp; Play BIOS Extension message. (PnP BIOS only)</li><li>2. Program all onboard super I/O chips (if any) including COM ports, LPT ports, FDD port ... according to setup value.</li></ol>
33-3B	Reserved.
3C	Set flag to allow users to enter CMOS Setup Utility.
3D	<ol style="list-style-type: none"><li>1. Initialize Keyboard.</li><li>2. Install PS2 mouse.</li></ol>
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 turn on later in POST 61h.

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3F-40	Reserved.
BF	1. Program the rest of the Chipset's value according to Setup. (Later Setup Value Program)
41	2. If auto-configuration is enabled, programm the chipset with pre-defined Values.
42	Initialize floppy disk drive controller.
43	Initialize Hard drive controller.
45	If it is a PnP BIOS, initialize serial & parallel ports.
44	Reserved.
45	Initialize math coprocessor.
46-4D	Reserved.
4E	If there is any error detected (such as video, kb...), show all error messages on the screen & wait for user to press <F1> key.
4F	1.If password is needed, ask for password. 2.Clear the Energy Star Logo. (Green BIOS only)
50	Write all CMOS values currently in the BIOS stack area back into the CMOS.
51	Reserved.
52	1.Initialize all ISA ROMs. 2.Later PCI initializations. (PCI BIOS only) <ul style="list-style-type: none"><li>- assign IRQ to PCI devices.</li><li>- initialize all PCI ROMs.</li></ul> 3.PnP Initialzations. (PnP BIOS only) <ul style="list-style-type: none"><li>- assign IO, Memory, IRQ &amp; DMA to PnP ISA devices.</li><li>- initialize all PnP ISA ROMs.</li></ul> 4.Program shadows RAM according to Setup settings.
	5.Program parity according to Setup setting.
	6.Power Management Initialization. <ul style="list-style-type: none"><li>- Enable/Disable global PM.</li><li>- APM interface initialization.</li></ul>
53	1.If it is NOT a PnP BIOS, initialize serial & parallel ports. 2.Initialize time value in BIOS data area by translate the RTC time value into a timer tick value.
60	Setup Virus Protection. (Boot Sector Protection) functionality according to Setup setting.

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- 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 & typematic speed according to Setup setting.
- 63        1. If there is any changes in the hardware configuration, update the ESCD information. (PnP BIOS only)
2. Clear memory that have been used.
3. Boot system via INT 19H.
- FF        System Booting. This means that the BIOS already pass the control right to the operating system.

**Unexpected Errors:**

**POST (hex) DESCRIPTION**

- B0        If interrupt occurs in protected mode.
- B1        Unclaimed NMI occurs.

