Chapter 1
Introduction

The P55-VX motherboard is a high performance system hardware based on Intel Pentium® processor and is equipped with four PCI slots, three standard ISA slots, Super Multi-I/O controller and dual ports PCI-IDE connectors for the future expansion. The hardware dimension is 220mm x 225mm with four layer design technology.

Specification

- Intel 82430VX PCIset chipset.

- Intel **Pentium**® Processor operating at **75 ~ 200 MHz** and **P55C** with **321 ZIF socket 7** and scalability to accept faster Processors in the future.

- Supports up to 128 MegaBytes DRAM(minimum of 8 MB) on board(72 Pins SIMM x 4), and BIOS auto FP DRAM and EDO DRAM configuration.(Refer to Chapter 2-4 System Memory Configuration)

- Supports Onboard Pipelined burst (synchronous) L2 **Write Back** Cache. The cache memory combination could be 256KB/512KB (32KB*32 or 64KB*32 SRAM respectively).

- Supports three 16 bits ISA slots, four 32 bits PCI slots, and provides two independent high performance PCI IDE interface capable of supporting **PIO Mode 3 and Mode 4** devices. The **P55-VX** supports four PCI Bus Masters and a jumperless PCI INT# control scheme which reduces configuration confusion when plug in PCI I/O controller card(s).

- Supports the Universal Serial Bus (USB) connector.

- Supports **ATAPI** (e.g. **CD-ROM**) devices on both IDE interface.

- Supports 1 floppy port, 1 parallel port (EPP,ECP port), and 2 serial port (16550 Fast UART compatible).

- Supports a **PS/2** style mouse and standard AT style keyboard connectors.

- Supports Award Plug & Play BIOS . The BIOS is stored in Flash EPROM form. It provides better upgradeability for the system.

- Supports CPU Hardware sleep and SMM (System Management Mode).

- **P55-VX** utilizes Lithium battery which provides environmental protection and longer life time.

P55-VX Layout
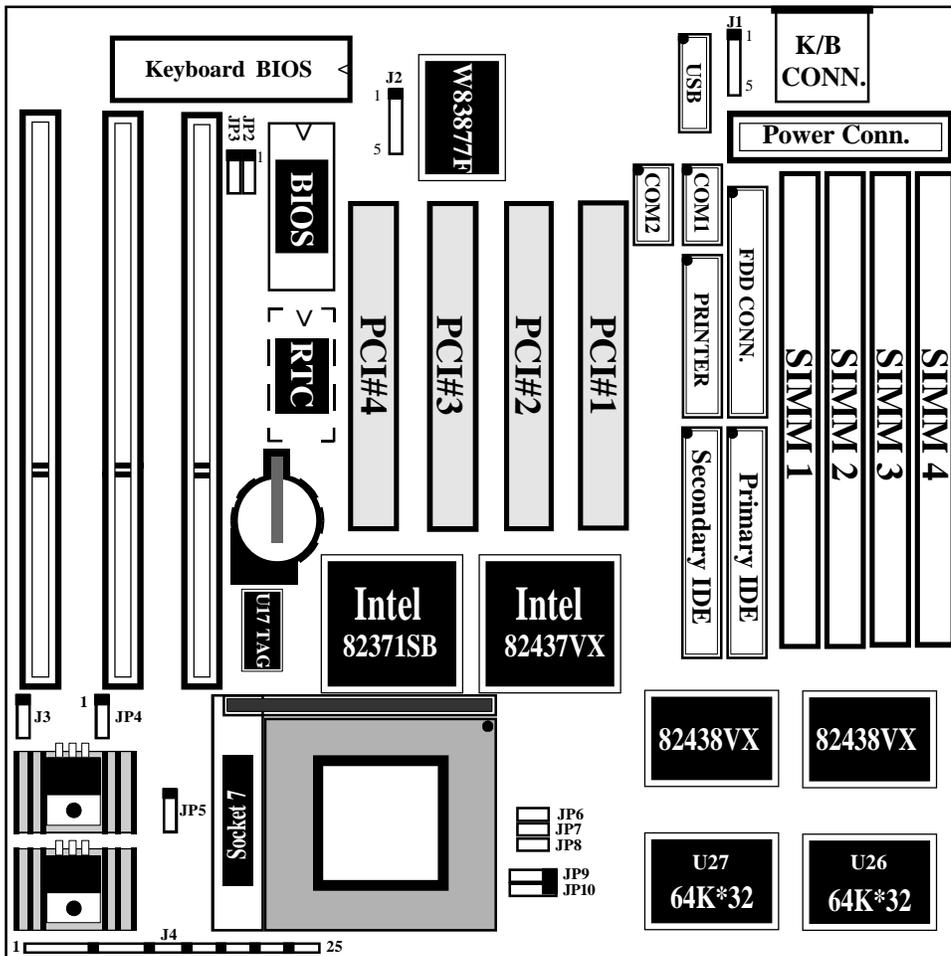
Figure 1-1

Chapter 2
Hardware design

2-1 Motherboard Layout

The P55-VX is designed with Intel 82430VX PCIset chipset which is developed by INTEL Corporation to fully support Pentium Processor PCI/ISA system. The Intel 82430VX PCIset chipset prpovides increased integration and improved performance designs. The chipset provides an integrated IDE controller with two high performance IDE interfaces for up to four IDE devices (hard devices, CD-ROM device, etc). The Winbond W83877F 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. The **P55-VX** layout is shown in previous page (left page) for user's reference. **Care must be taken** when inserting memory modules, inserting CPU or even plugging PCI card into associated slots to avoid damaging any circuits or sockets on board. A cooling fan is strongly recommended when installing P54C/P54CTB/P55C/K5/6x86 processor due to possible overheat.

The P55-VX supports minimum of 8MB of System Memory and maximum of 128MB while L2 Cache can be 256KB/512KB synchronous SRAM Onboard to increase system performance.(refer to **Page 2-3 Cache Memory Configuration** for the details.)

The P55-VX supports standard Fast Page and EDO (Extended Data Out or Hyper Page Mode). **The P55-VX** provides four 72-pins SIMM sites for memory expansion. The socket support 1M x 32(4MB), 2M x 32(8MB), 4M x 32(16MB), and 8M x 32(32MB) single-sided or double-sided memory modules. The memory timing requires 70 nS Fast page devices or 60 nS EDO DRAM.

The P55-VX supports **Onboard two PCI IDE** connectors, and detects IDE harddisk type by BIOS utility automatic.

The P55-VX supports **USB**(Universial Serial Bus) connector in the future.

The P55-VX supports Award Plug & Play BIOS for the ISA and PCI cards. The BIOS can be located in Flash EPROM. The advantage of having Flash EPROM is much easier to replace BIOS code if necessary.

2-2 Connectors and Jumpers

This section describes all of the connectors and jumpers equipped in the motherboard. Please refer to **Figure 1-1** for actual location of each connector and jumper.

1

J4   KeyLock - Keyboard lock switch & Power LED connector.
        1.Power LED(+)
        2.N/C
        3.GND
        4.Keylock

5
        5.GND

7
Speaker - connect to the system's speaker for beeping.
        7. Speaker
        8. N/C
        9. GND

10
        10. GND

12
Reset - Close to restart system.

13

15 +
Turbo LED indicator - LED ON when higher speed is selected.

16

18
Sleep/Resume switch : Close to enter sleep mode.

19
A keystrobe or mouse movement (mouse driver exists). The system will instantly "wake up".

21 +
Power Saving LED indicator - LED ON when system is in any

22
saving mode.

24 +
IDE LED indicator - LED ON when Onboard PCI IDE

25
Harddisks activites.

J1 PS/2 MOUSE CONNECTOR:

1
        1.RED wire
        2.BLUE wire
        3.GREEN wire
        4.NC
        5.YELLOW wire

5

J2   **1**   **IrDA/ASK IR CONNECTOR:**
              1.VCC
              2.NC
              3.IRRX
              4.GND
         5   5.IRTX
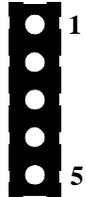
J3   **1**   **The Power Supply (+12V) of the CPU Cooling FAN:**
              1.GND
              2.+12V
         3   3.GND
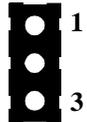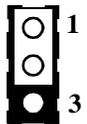
JP2   **1**   **EPROM BIOS Select :**
               1-2 : 5V Flash EPROM.(SST, Winbond).
          3   2-3 : 12V Flash EPROM (Intel).
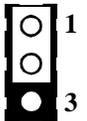
JP3   **1**   **BIOS Flash Mode:**
               1-2 : Normal Flash
          3   2-3 : Boot Block Flash

JP4   **1**   **CPU Vcore Voltage select :**
               1-2 : 2.5V
          3   2-3 : 2.8V(Manufacture Default)
             Open : 2.9V
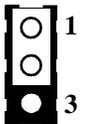
> **Note** : **JP4** is reserved for Pentium **MMX**, Cyrix 6x86**L** and
>   AMD **K6** only. For others CPU, it must be ignored.

Intel Pentium / Pentium MMX Processor Installation					
Clock/CPU Op.	JP6	JP7	JP8	JP9	JP10
50/75 MHz	OFF	ON	ON		
60/90 MHz	OFF	OFF	ON	1-2	1-2
66/100 MHz	OFF	ON	OFF		
60/120 MHz	OFF	OFF	ON	1-2	2-3
66/133 MHz	OFF	ON	OFF		
60/150 MHz	OFF	OFF	ON	2-3	2-3
66/166 MHz	OFF	ON	OFF		
60/180 MHz	OFF	OFF	ON	2-3	1-2
66/200 MHz	OFF	ON	OFF		

JP6
JP7
JP8

3 2 1

JP9
JP10
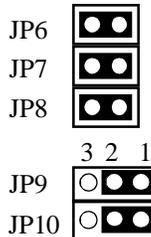
* **Clock is System Clock.**
* **CPU OP. : CPU operation at 75, 90, 100 MHz, and etc.**

Cyrix 6x86 / 6x86L Installation					
CPU TYPE	JP6	JP7	JP8	JP9	JP10
6x86-P120+	OFF	ON	ON		
6x86-P133+	OFF	OFF	OFF		
6x86-P150+	OFF	OFF	ON	1-2	2-3
6x86-P166+	OFF	ON	OFF		
6x86-P200+	ON	OFF	OFF		

Reserved

* **6x86-P120+ = 50/100MHz, 6x86-P133+ = 55/110MHz**
* **6x86-P150+ = 60/120MHz, 6x86-P166+ = 66/133MHz**
* **6x86-P200+ = 75/150MHz,**

*Note 1 : If the Cyrix M1(6x86/6X86L) is installed on the P55-VX motherboard, one of   the two types of cooling fan(Model NO. 20750 is normal /standard fan/ heatsink. Model NO. 20832 is 90 degree rotated fan.) must be selected correctly to match the regulator heatsink direction. **The P55-VX reguires the use of Model NO : 20832.(Customer should reguest NMB-B50 fan)**. Please Contact the Cyrix CPU suppliers for the details.*

Note 2 : *If the Cyrix **6x86/6x86L-P200+** is installed on the **P55-VX** motherboard, there is a limitation : **It cannot work properly with the PCI 2.0 SCSI card**.(**For example : Adaptec AHA-2940/3940**). It will make your system hang or damage the data in the harddisk. Please do not install 6x86-P200+ with PCI 2.0 SCSI card on P55-VX motherboard.*
But, You can choose PCI 2.1 SCSI card(For example : AHA-2940AU/ 2940UW). They do not have above problem.

AMD K5 Installation					
CPU TYPE	JP6	JP7	JP8	JP9	JP10
K5-PR75	OFF	ON	ON	1-2	1-2
K5-PR90	OFF	OFF	ON		
K5-PR100	OFF	ON	OFF		
K5-PR133	OFF	ON	OFF	1-2	2-3
K5-PR166	OFF	ON	OFF	2-3	2-3

Reserved

2-3 Cache Memory Configuration

The second level (L2) of cache is installed in the motherboard to increase the system performance. The cache size can be 256KB or 512KB optional. Please refer to following configurations for the details.

U27   **U26**

64K*32   **64K*32**

U17

TAG SRAM   **DATA SRAM**

SYN.CACHE Size	Data SRAM (U27,U26)	TAG SRAM (U17)	STATUS
256KB	32K * 32	8K * 8 or 16K * 8 or 32K * 8	Reserved
512KB	64K * 32	16K * 8 or 32K * 8	Default

2-4 System Memory Configuration

The **P55-VX** supports different type of settings for the system memory. There is no jumper nor connector needed for memory configuration. Following figures provides all possible memory cominations.

M4
M3

>   BANK 1　FP / EDO DRAM

M2
M1

>   BANK 0　FP / EDO DRAM
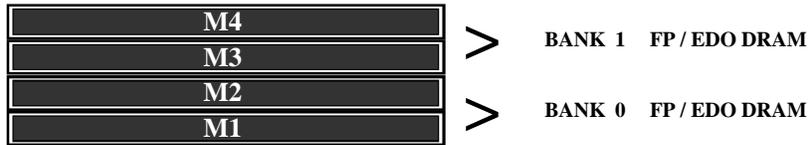
M1+M2(BANK 0)	M3+M4(BANK 1)	Total Size
4M x 2 (8 MB)	Empty	8MB
4M x 2 (8 MB)	4M x 2 (8 MB)	16MB
4M x 2 (8 MB)	8M x 2 (16 MB)	24MB
4M x 2 (8 MB)	16M x 2 (32 MB)	40MB
4M x 2 (8 MB)	32M x 2 (64 MB)	72MB
8M x 2 (16 MB)	Empty	16MB
8M x 2 (16 MB)	4M x 2 (8 MB)	24MB
8M x 2 (16 MB)	8M x 2 (16 MB)	32MB
8M x 2 (16 MB)	16M x 2 (32 MB)	48MB
8M x 2 (16 MB)	32M x 2 (64 MB)	80MB
16M x 2 (32 MB)	Empty	32MB
16M x 2 (32 MB)	4M x 2 (8 MB)	40MB
16M x 2 (32 MB)	8M x 2 (16 MB)	48MB
16M x 2 (32 MB)	16M x 2 (32 MB)	64MB
16M x 2 (32 MB)	32M x 2 (64 MB)	96MB
32M x 2 (64 MB)	Empty	64MB
32M x 2 (64 MB)	4M x 2 (8 MB)	72MB
32M x 2 (64 MB)	8M x 2 (16 MB)	80MB
32M x 2 (64 MB)	16M x 2 (32 MB)	96MB
32M x 2 (64 MB)	32M x 2 (64 MB)	128MB

NOTE : 1. P55-VX support both Fast Page DRAM or EDO DRAM SIMMs, but they cannot be mixed within the same memory bank.

       2. SIMMs may be parrity(x 36) or non parity (x 32).

       3. The 70nS Fast Page Mode or 60nS EDO DRAM is necessary.

2-5 Integrated PCI Bridge

The **P55-VX** utilizes **Intel's 430VX PCIset** chipset to support Intel Pentium
Processor PCI/ISA system. The Intel 82430VX PCIset chipset consists of the
82437VX system controller (TSC), two 82438VX Data Path (TDP) devices, and
one 82371SB PCI ISA/IDE Accelerator (PIIX3) bridge chip. It provides an inter-
face which translates CPU cycle into PCI bus cycle, and PCI burst read/write
capability. In addition, it provides high performance PCI arbitor to support four
PCI Masters, Rotating Priority Mechanism, and Hidden Arbitration Scheme
Minimizes Arbitration Overhead.

There are four interrupts in each PCI slot : INTA#, INTB#, INTC#, and INTD#.
Since the **P55-VX** adapts the PCI auto-configuration with the system BIOS Setup
utility. When the system is turned on after adding a PCI add-in card, the BIOS
automatically configure interrupts, DMA channels, I/O space, and other
paramaters. You do not have to configure jumpers or worry potential resource
conflicts. Because PCI cards use the same interrupt resource as ISA cards, you must
specify the interrupt used by ISA add-in cards in the BIOS Setup utility.

If however, a "Legacy card" (such as plug paddle card and cable into the ISA slot.)
is plugged in the system, modification in the **ROM SETUP UTILITY** become
necessary. First, enter **PCI CONFIGURATION SETUP** utility from **ROM
SETUP UTILITY** main menu to set the "**PCI IDE IRQ MAP TO : ISA**".

Secondly, you must enter **CHIPSET FEATURES SETUP UTILITY** from **ROM
SETUP UTILITY** main menu and set the "**Onboard Primary PCI IDE: Disabled**
and **Onboard Secondary PCI IDE: Disabled**." When you plugg the PCI/ISA IDE
card into the system, You should **Disabled Onboard Primary and Secondary PCI
IDE** from **CHIPSET FEATURES SETUP UTILITY** too.

Some "Legacy card" (no paddle card and cable.) you can set the system interrupt
request (IRQ) on the "Legacy card" (refer to user's manual of the card) to a proper
system IRQ level (in general, card's Primary assigned to INTA and Secondary
assigned to INTB). If the card is plugged into slot 1(marked PCI#1), you can not
use second slot (marked PCI#2) because the Secondary INT signal takes INTB
from the slot (refer to Page 3-12 for circuit diagram). The user then enter   **PCI
CONFIGURATION SETUP** utility from **ROM SETUP UTILITY** main menu
and set the "**PCI IDE IRQ MAP TO** : **PCI-Slot 1**" (depend on the slot # where the
Legacy card is plugged).

.

CHAPTER 3
AWARD BIOS SETUP

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

It is possible that CMOS had a battery failure which cause data lose in CMOS_RAM. If so, re_enter system configuration parameters become necessary.

To enter Setup Propgram

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

```
┌──────────────────────────────────────────────────────────────┐
│                ROM PCI/ISA BIOS(2A59GPA9)                      │
│                    CMOS SETUP UTILITY                          │
│                   AWARD SOFTWARE, INC.                         │
├──────────────────────────────────────────────────────────────┤
│  STANDARD CMOS SETUP          SUPERVISOR  PASSWORD             │
│  BIOS FEATURES SETUP          USER  PASSWORD                   │
│  CHIPSET FEATURES  SETUP      IDE HDD AUTO DETECTION           │
│  POWER  MANAGEMENT SETUP      HDD LOW LEVEL FORMAT             │
│  PNP/PCI CONFIGURATION        SAVE & EXIT SETUP                │
│  INTEGRATED PERIPHERALS       EXIT WITHOUT SAVING              │
│  LOAD SETUP DEFAULTS                                           │
├──────────────────────────────────────────────────────────────┤
│   ESC  : QUIT            ↑ ↓ → ←   :  SELECT ITEM              │
│   F10   :  Save & Exit Setup    (Shift)F2  :  Change Color     │
├──────────────────────────────────────────────────────────────┤
│              Time, Date, Hard Disk Type...                     │
└──────────────────────────────────────────────────────────────┘
```

Figure 3-1 CMOS SETUP UTILITY

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

3-1 STANDARD CMOS SETUP

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

```
                    ROM PCI/ISA BIOS(2A59GPA9)
                      STANDARD CMOS SETUP
                      AWARD SOFTWARE, INC.


 Date (mm:dd:yy) : Wed, Apr 17 1996
 Time (hh:mm:ss) :  14 : 30 : 50


 HARD DISKS      TYPE  SIZE  CYLS   HEAD   PRECOMP  LANDZONE  SECTORS  MODE
 Primary Master    : Auto   0     0      0        0         0         0     Auto
 Primary Slave     : Auto   0     0      0        0         0         0     Auto
 Secondary Master : Auto    0     0      0        0         0         0     Auto
 Secondary Slave  : Auto    0     0      0        0         0         0     Auto


 Drive A :  1.44M,3.5 in.
 Drive B :  None                          Base Memory  :    640K
                                          Extended Memory :  5360K
 Video   :  EGA/VGA                       Other Memory :    384K
 Halt On :  All Errors
                                          Total Memory :  16384K

 ESC : Quit            ↑ ↓ → ←  : Select Item        PU/PD/+/- : Modify
 F1  : Help            (Shift) F2  : Change Color
```

Figure 3-2 STANDARD CMOS SETUP

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

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

3-2 BIOS FEATURES SETUP

Selecting the "**BIOS FEATURES SETUP**" option in the **CMOS SETUP UTILITY** menu allows user to change system related parameters in the displayed menu. This menu shows all of the manufacturer's default values of P55-VX. Again, user can move the cursor by pressing direction keys and <PgDn> or <PgUp> keys to modify the parameters. Pressing [F1] key to display help message of the selected item.

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

```
                    ROM PCI/ISA BIOS(2A59GPA9)
                         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        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
Type matic Delay (Msec)    : 250
Security Option            : Setup      Esc : Quit         ↑ ↓ → ← :Select Item
PCI/VGA Palette Snoop      : Disabled   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 procedure.

- **Virus Warning:** This category flashes on the screen. During and after the system boots up, any attempt to write to the boot sector or partition table of the hard disk drive will halt the system and the following error message will appear, in the mean time, you can run an anti-virus program to locate the problem. Default value is Disabled

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

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

- **CPU Internal Cache / External Cache:**These two categories speed up memory access. However, it depends on CPU/chipset design. The default value is Enable. If your CPU is without Internal Cache then this item "CPU Internal 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.
  Enabled **:** Enable quick POST.
  *Disabled***:** Normal POST.

- **Boot Sequence:**This category determines which drive computer searches first for the DOS(Disk Operating System). Default value is A,C.
  A,C **:**System will first search for floppy disk drive then hard disk drive.
  C,A **:**System will first search for hard disk drive then floppy disk drive.

- **Swap Floppy Drive:** The swap floppy drive. Default value is Disabled.
  Enabled **:**Floppy A & B will be swapped under the DOS.
  Disabled **:**Floppy A & B will be not swap.

- **Boot Up Floppy Seek:** During POST,BIOS will determine if the floppy disk drive installed is 40 or 80 tracks. 360K type is 40 tracks while 760K, 1.2M and 1.44M are all 80 tracks. The default value is Enabled.
  Enabled **:** BIOS searches for floppy disk drive to determine if it is 40 or 80 tracks, Note that BIOS can not tell from 720K, 1.2M or 1.44M drive type as they are all 80 tracks.
  *Disabled***:** BIOS will not search for the type of floppy disk drive by track number. Note that there will not be any warning message if the drive installed is 360K.

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

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

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

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

- **Typematic Rate(Chars/Sec):**
   6 : 6   characters per second.   8 : 8   characters per second.
   10: 10 characters per second.   12: 12 characters per second.
   15: 15 characters per second.   20: 20 characters per second.
   24: 24 characters per second.   30: 30 characters per second.

- **Typematic Delay(Msec):** When holding a key, the time between the first and
   second character displayed.
   250 : 250msec.
   500 : 500 msec.
   750 : 750 msec.
   1000: 1000 msec.

- **Security Option:** This category allows you to limit access to the system and Setup,
   or just to Setup. The default value is Setup.
   System: The system will not boot and access to Setup 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 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(2A59GPA9)
CHIPSET FEATURES SETUP
AWARD SOFTWARE, INC.
```

Auto Configuration	: Enabled	
DRAM Timing	: 60 ns	
DRAM RAS# Precharge Time	: 3	
DRAM R/W Leadoff Timing	: 6	
Fast RAS to CAS Delay	: 3	
DAM Read Burst (EDO/FP)	: x222/x333	
DRAM Write Burst Timing	: x222	
Fast MA to RAS# Delay CLK	: 1	
Fast EDO Path Select	: Disabled	
Refresh RAS# Assertion	: 4 Clks	
ISA Bus Clock	: PCICLK/4	
SDRAM (CAS Lat/RAS-to-CAS)	: 3/3	
System BIOS Cacheable	: Disabled	
Video BIOS Cacheable	: Enabled	
8 Bit I/O Recovery Time	: 1	
16 Bit I/O Recovery Time	: 1	ESC : Quit ↑ ↓ → ← : Select Item
Memory Hole At 15M-16M	: Disabled	F1 : Help PU/PD/+/- : Modify
Peer Concurrency	: Enabled	F5 : Old Values (Shift) F2 : Color
Chipset NA# Asserted	: Enabled	F7 : Load Setup Defaults

Figure 3-4 CHIPSET FEATURES SETUP

● **Auto Configuration:**This Category allows you to set the DRAM timing. The default value is Enabled. When disabled this field. You can select the different DRAM's timing that supports by chipset below item.

Note: When you insert slower memery modules in the system and set a faster timing. Maybe the system will hang up.

- **DRAM Timing:** The default value is 60ns.
  60ns **:** 2 (faster) Burst Wait State, for 60~70ns Fast Page Mode/EDO DRAM.
  70ns **:** 3 (slower) Burst Wait State, for 70ns Fast Page Mode/EDO DRAM.

- **Video BIOS Cacheable:** The default value is Enabled.
  Enabled **:** This field Enabled the Video BIOS Cacheable to speed up the VGA
            Performance.
  *Disabled***:** Disabled 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 enableds the main memory (15~16MB) remap to ISA BUS.

- **Peer Concurrency:**The default value is Enabled.

- **Chipset NA# Asserted:**The default value is Enabled.

3-4 POWER MANAGEMENT SETUP

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

```
                         ROM PCI/ISA BIOS
                    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
                                         IRQ5   (LPT  2)          : ON
Doze Mode               : Disable        IRQ6   (Floppy Disk)     : ON
Standby  Mode           : Disabled       IRQ7   (LPT  1)          : OFF
Suspend  Mode           : Disabled       IRQ8   (RTC Alarm)       : OFF
HDD Power Down           : 15  Min       IRQ9   (IRQ2  Redir)     : ON
                                         IRQ10  (Reserved)        : ON
** Wake Up Events In Doze & Standby **   IRQ11  (Reserved)        : ON
IRQ3 (Wake-Up Event)    : ON             IRQ12  (PS/2 Mouse)      : ON
IRQ4 (Wake-Up Event)    : ON             IRQ13  (Coprocessor)     : ON
IRQ8 (Wake-Up Event)    : ON             IRQ14  (Hard Disk)       : ON
IRQ12 (Wake-Up Event)   : ON             IRQ15  (Reserved0        : ON

                                         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**'.

3-4-1 The Description of the Power Management

A. Power Management mode selection :

  Disabled   **:** The system operates in NORMAL conditions (Non-GREEN), and and the Power Management function is disabled.

  Max.saving: This mode will maximize the power saving capability.

  Min.saving: This mode will minimize the power saving capability.

  User define: Allow user to define timeout parameters to control power saving timing. Refer to item B shown below.

B. Timeout parameters :

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

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

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$^{®}$Procssor 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.

3-4-2 Description of the Green Functions

The P55-TV supports HDD Power Down, Doze and standby power saving functions
when Intel Pentium$^{®}$Processor is installed. In addition, the suspend function
is supported when the J4 (sleep ref. Figure1-1) be close to enter the green function.
The detail description of these functions are provided in next page.

HDD Standby Mode
When system stop reading or wiriting 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 wirte to HDD command is executed again.

Doze Mode
The system hardware will drop down CPU clock from nomal working speed
when Doze mode timeout occurrs.

Standby Mode
When the system standby mode timer runs 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 consunption in
Suspend Mode is lower than in standby mode. The screen is also blanked out.

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

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 : Any misplacing IRQ could cause system can't pick out the rescouces.

```
ROM PCI/ISA BIOS(2A59CPA9)
PNP/PCI CONFIGURATION
AWARD SOFTWARE, INC.
```

Resources Controlled By	: Manual	PCI IRQ Actived By	: Level
Reset Configuration Data	: Disabled	PCI IDE IRQ Map To	: PCI-AUTO
		Primary IDE INT#	: A
IRQ-3 assigned to	: Legacy ISA	Secondary IDE INT#	: B
IRQ-4 assigned to	: Legacy ISA		
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		
DMA-3 assigned to	: PCI/ISA PnP	ESC : Quit	↑ ↓ → ← : Select Item
DMA-5 assigned to	: PCI/ISA PnP	F1 : Help PU/PD/+/-	: Modify
DMA-6 assigned to	: PCI/ISA PnP	F5 : No Change (Shift) F2	: Color
DMA-7 assigned to	: PCI/ISA PnP	F7 : Load Setup Defaults	

Figure 3-6 PCI CONFIGURATION SETUP

• **Resource Controlled By:**The default value is Manual.
  Manual: The field defines that the PNP Card's resource is controlled by manual.
  You can set which IRQ-X and DMA-X assigned to PCI/ISA PNP or
  Legacy ISA Cards.
  Auto: If your ISA card and PCI card are all PNP cards. To set this field Auto.
  The BIOS will be assigned the interrupt resource automatically.

• **Reset Configuration Data:**The default value is Disabled
  Disabled: Normal Setting
  Enabled: If you had plugged some Legacuy cards in the system and there were
  record into ESCD(Extended System Configuration Data). You can set this
  field to Enabled and to clear ESCD one time. When some Legacy cards
  were removed.

● **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 (describbed in section 2-5) 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.

PCI#4	PCI#3	PCI#2	PCI#1		PCI Chipset
INTB	INTC	INTD	INTA	INTA	
INTC	INTD	INTA	INTB	INTB	
INTD	INTA	INTB	INTC	INTC	
INTA	INTB	INTC	INTD	INTD	
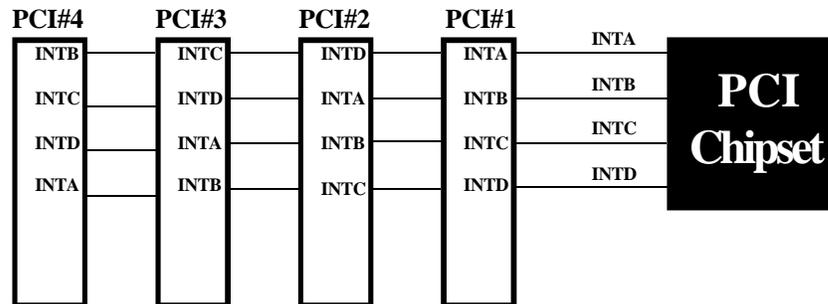
Figure 3-7 The Combination of PCI INT# lines

3-6 INTEGATED PERIPHERALS

```
ROM  PCI/ISA  BIOS(2A59GPA9)
INTEGRATED PERIPHERALS
WARD  SOFTWARE, INC.
```

IDE HDD Block Mode	: Enabled
IDE Primary Master PIO	: Auto
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 1	: 3F8/IRQ4
Onboard UART 2	: 2F8/IRQ3
Onboard UART 2 Mode	: Standard
Onboard Parallel Port	: 378/IRQ7
Parallel Port Mode	: ECP+EPP
ECP Mode Use DMA	: 3
Parallel Port EPP Type	: EPP1.9

```
ESC  : Quit                          ↑  ↓  →  ←  : Select Item
F1   : Help                       PU/PD/+/-  : Modify
F5   : No Change                  (Shift) F2  : Color
F7   : Load Setup Defaults
```

Note: **If you don't use the Onboard IDE connector, than use On-card (PCI or ISA card) IDE connector. You will set Onboard Primary 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:** The default value is Enabled.
  Enabled : Enabled IDE HDD Block Mode. The HDD transfer rate is better than Disable.
  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 : Enable Onboard 1st channel IDE port.
  Disabled : Disable Onboard 1st channel IDE port. When use On-card (PCI or ISA card) IDE connector.

- **Onboard Secondary PCI IDE:** The default value is Enabled.
  Enabled : Enable Onboard 2nd channel IDE port.
  Disabled : Disable Onboard 2nd channel IDE port When use On-card (PCI or ISA card) IDE connector.

- **IDE Primary Master PIO:** The default value is Auto.
  Auto   : BIOS will automatically detect the Onboard Primary Master PCI
              IDE HDD Accessing mode.
  Mode0~4   : Manually set the IDE Accessing mode.

- **IDE Primary Slave PIO:** The default value is Auto.
  Auto   : BIOS will automatically detect the Onboard Primary Slave PCI IDE
              HDD Accessing mode.
  Mode0~4   : Manually set the IDE Accessing mode.

- **IDE Secondary Master PIO:** The default value is Auto.
  Auto   : BIOS will automatically detect the Onboard Secondary Master PCI
              IDE HDD Accessing mode.
  Mode0~4   : Manually set the IDE Accessing mode.

- **IDE Secondary Slave PIO:** The default value is Auto.
  Auto   : BIOS will automatically detect the Onboard Secondary Slave PCI
              IDE HDD Accessing mode.
  Mode0~4   : Manually set the IDE Accessing mode.

- **Onboard FDC Controller:** The default value is Enabled.
  Enabled   : Enable the Onboard SMC CHIP's floppy drive interface controller.
  Disabled : Disable the Onboard SMC CHIP's floppy drive interface controller.
              When use On-card ISA FDC's controller.

- **Onboard UART 1:** This field allows the user to sellect the serial port. The default
  value is 3F8H/IRQ4.
  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 sellect the serial port. The default
  value is 2F8H/IRQ3.
  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.
   HPSIR: Support a HP Serial Infrared Interface formats.
   ASKIR: Support a Sharp Serial Infrared Interface formats.

● **Onboard Parallel port:** This field allows the user to sellect 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.

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

● **Parallel port Mode:** This field allows the user to sellect 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 sellect DMA1 or DMA3 for
   the ECP mode. The default value is DMA3.
   DMA1   **:** The filed selects the routing of DMA1 for the ECP mode.
   DMA3   **:** The filed 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 initialize associated hardware properly. This function will be necessary
only when the system CMOS data is corrupted.

```
ROM PCI/ISA BIOS(2A59GPA9)
CMOS SETUP UTILITY
AWARD SOFTWARE, INC.
```

STANDARD CMOS SETUP	SUPERVISOR PASSWORD
BIOS FEATURES SETUP	USER PASSWORD
CHIPSET FEATURES SETUP	IDE HDD AUTO DETECTION
POWER MANAGEMENT SETUP	HDD LOW LEVEL FORMAT
PNP/PCI CONFIGURA **Load SETUP Default (Y/N)? Y** TUP	
INTEGRATED PERIPH AVING	
LOAD SETUP DEFAULTS	

```
ESC: QUIT                          ↑↓→← :SELECT ITEM
F10:Save & Exit Setup              (Shift)F2 :Change Color
```

```
Load Setup Defaults Except Standard COMS SETUP
```

Figure 3-8 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 3-3 for the details).

1. 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.

```
            ROM  PCI/ISA  BIOS(2A59GPA9)
                CMOS  SETUP  UTILITY
               AWARD  SOFTWARE,  INC.


  HARD DISKS      TYPE  SIZE  CYLS  HEADS  PRECOMP  LANDZONE  SECTORS  MODE

  Primary Master    :        343   665    16      65535        664       63     NORMAL
  Primary Slave     :
  Secondary Master  :
  Secondary Slave   :
  ┌─────────────────────────────────────────────────────────────┐
  │         Select Secondary Slave Option (N=Skip) : N            │
  │                                                               │
  │  OPTIONS   SIZE  CYLS  HEAD  PRECOMP  LANDZ  SECTOR  MODE      │
  │                                                               │
  │   1 (Y)     0     0     0        0      0       0   NORMAL     │
  └─────────────────────────────────────────────────────────────┘
                          ESC : Skip
```
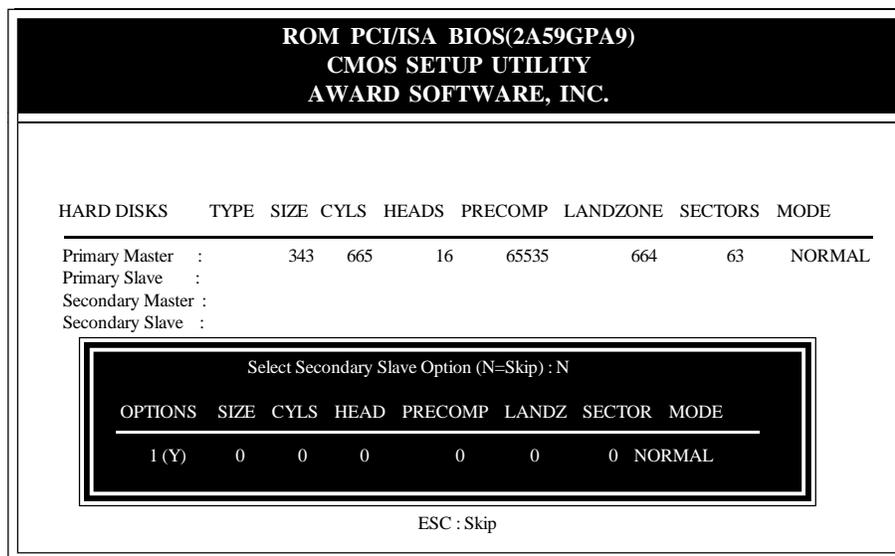
Figure 3-9 IDE HDD AUTO DETECTION

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 nunber of cylinders, head & sectors for NORMAL mode are.
     1024, 16 & 63.

	no. Cyclinder	(1024)
x	no. Head	(16)
x	no. Sector	(63)
x	no. per sector	(512)
	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. Cyclinder        (1024)
x  no. Head          ( 255)
x  no. Sector        (  63)
 x  bytes per secttor      ( 512)
        8.4 Gigabytes
```

LARGE mode

Extended HDD access mode supported by Award Software.

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

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

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

Maximum HDD size:

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

Note:

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

Slect 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.

3-11 SAVE & EXIT SETUP

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

3-12 EXIT WITHOUT SAVING

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

Chapter 4
Technical Information

4-1 I/O & MEMORY MAP

MEMORY MAP

Address Range	Size	Description
[00000-7FFFF]	512K	Conventional memory
[80000-9FBFF]	127K	Extended Conventional memory
[9FC00-9FFFF]	1K	Extended BIOS data area if PS/2 mouse is installed
[A0000-C7FFF]	160K	Available for Hi DOS memory
[C8000-DFFFF]	96K	Available for Hi DOS memory and adapter ROMs
[E0000-EEFFF]	60K	Available for UMB
[EF000-EFFFF]	4K	Video service routine for Monochrome & CGA 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)

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.

4-2 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.

4-3 INTERRUPT MAP

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

4-4 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 ectension memory low bytw.
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 A: POST CODES

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

POST(hex)   DESCRIPTION

01-02   Reserved.

C0   Turn off OEM specific cache, shadow.

03   1.Initialize EISA registers (EISA BIOS only).
               2.Initialize all the standard devices with default values Standard devices includes.
                   -DMA controller (8237).
                    -Programmable Interrupt Controller (8259).
                    -Programmable Interval Timer (8254).
                    -RTC chip.

04   Reserved

05   1.Keyboard Controller Self-Test.
               2.Enable Keyboard Interface.

06   Reserved.

07   Verifies CMOS's basic R/W functionality.

C1   Auto-detection of onboard DRAM & Cache.

C5   Copy the BIOS from ROM into E0000-FFFFF shadow RAM so that POST will
               go faster.

08   Test the first 256K DRAM.

09   OEM specific cache initialization. (if needed)

0A   1.Initialize the first 32 interrupt vectors with corresponding Interrupt handlers
                 Initialize INT no from 33-120 with Dummy (Suprious)
                 Interrupt Handler.
               2.Issue CPUID instruction to identify CPU type.
               3.Early Power Management initialization. (OEM specific)

0B   1.Verify the RTC time is valid or not.
               2.Detect bad battery.
               3.Read CMOS data into BIOS stack area.
               4.PnP initializations including. (PnP BIOS only)
                   -Assign CSN to PnP ISA card.
                    -Create resource map from ESCD.
               5.Assign IO & Memory for PCI devices. (PCI BIOS only)

POST(hex)   DESCRIPTION

0C   Initialization of the BIOS Data Area. (40:ON - 40:FF)

0D   1.Program some of the Chipset's value according to Setup. (Early Setup Value
             Program)
             2.Measure CPU speed for display & decide the system clock speed.
             3.Video initialization including Monochromc, CGA, EGA/VGA. If no display
             device found, the speaker will beep.

0E   1.Test video RAM. (If Monochromc display device found)
             2.Show messages including.
                  -Award Logo, Copyright string, BIOS Data code & Part No.
                  -OEM specific sign on messages.
                  -Energy Star Logo. (Green BIOS ONLY)
                  -CPU brand, type & speed.
                  -Test system BIOS checksum. (Non-Compress Version only)

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, exccute EISA initialization. (EISA BIOS only)

1F-29   Reserved.

30   Detect Base Memory & Extended Memory Size.

31   1.Test Base Memory from 256K to 640K.
             2.Test Extended Memory from 1M to the top of memory.

POST(hex)   DESCRIPTION

32
1.Display the Award Plug & Play BIOS Extension message. (PnP BIOS only)
2.Program all onboard super I/O chips (if any) including COM ports, LPT
   ports, FDD port ... according to setup value.

33-3B   Reserved.

3C   Set flag to allow users to enter CMOS Setup Utility.

3D
1.Initialize Keyboard.
2.Install PS2 mouse.

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.

3F-40   Reserved.

BF
1.Program the rest of the Chipset's value according to Setup. (Later Setup Value
   Program)
2.If auto-configuration is enabled, programmed the chipset with pre-defined
   Values.

41   Initialize floppy disk drive controller.

42   Initialize Hard drive controller.

43   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 the 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.

POST(hex)   DESCRIPTION

52
1.Initialize all ISA ROMs.
2.Later PCI initializations. (PCI BIOS only)
   -assign IRQ to PCI devices.
   -initialize all PCI ROMs.
3.PnP Initialzations. (PnP BIOS only)
   -assign IO, Memory, IRQ & DMA to PnP ISA devices.
   -initialize all PnP ISA ROMs.
4.Program shadows RAM according to Setup settings.
5.Program parity according to Setup setting.
6.Power Management Initialization.
   -Enable/Disable global PM.
   -APM interface initialization.

53
1.If it is NOT a PnP BIOS, initialize serial & paralled 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.

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.

## APPENDIX B: I/O CONNECTORS

J1 : PS/2 MOUSE CONNECTOR:
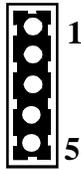
Pin	Signal Name
1	Data (Red Wire)
2	Clock (Blue Wire)
3	GND (Green Wire)
4	NC
5	VCC (Yellow Wire)

CN2/COM1,CN3/COM2 : Serial Ports Connector
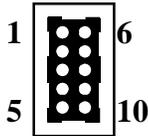
Signal Name	Pin	Pin	Signal Name
DCD	1	6	DSR
SIN	2	7	RTS
SOUT	3	8	CTS
DTR	4	9	RI
GND	5	10	N.C.

CN5 : Parallel Port Connector
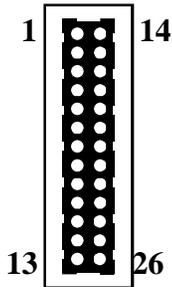
Signal Name	Pin	Pin	Signal Name
STROBE-	1	14	AUTO FEED-
Data Bit 0	2	15	ERROR-
Data Bit 1	3	16	INIT-
Data Bit 2	4	17	SLCT IN-
Data Bit 3	5	18	Ground
Data Bit 4	6	19	Ground
Data Bit 5	7	20	Ground
Data Bit 6	8	21	Ground
Data Bit 7	9	22	Ground
ACJ-	10	23	Ground
BUSY	11	24	Ground
PE	12	25	Ground
SLCT	13	26	N.C.

CN4 : Floppy Disk Connector
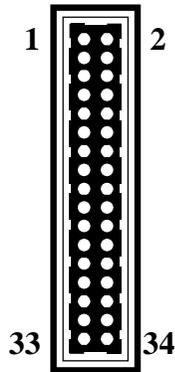
Signal Name	Pin	Pin	Signal Name
Ground	1	2	FDHDIN
Ground	3	4	Reserved
Ground	5	6	FDEDIN
Ground	7	8	Index-
Ground	9	10	Motor Enable
Ground	11	12	Drive Select B-
Ground	13	14	Drive Select A-
Ground	15	16	Motor Enable
Ground	17	18	DIR-
Ground	19	20	STEP-
Ground	21	22	Write Data
Ground	23	24	Write Gate
Ground	25	26	Track 00-
Ground	27	28	Write Protect-
Ground	29	30	Read Data-
Ground	31	32	SIDE 1 SELECT-
Ground	33	34	Diskette

CN6/CN7 : Primary, Secondray IDE Connector
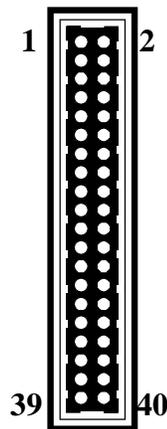
| Signal Name	Pin	Pin	Signal Name
Reset IDE	1	2	Ground
Host Data 7	3	4	Host Data 8
Host Data 6	5	6	Host Data 9
Host Data 5	7	8	Host Data 10
Host Data 4	9	10	Host Data 11
Host Data 3	11	12	Host Data 12
Host Data 2	13	14	Host Data 13
Host Data 1	15	16	Host Data 14
Host Data 0	17	18	Host Data 15
Ground	19	20	Key
DRQ3	21	22	Ground
I/O Write-	23	24	Ground
I/O Read-	25	26	Ground
IOCHRDY	27	28	BALE
DACK3-	29	30	Ground
IRQ14	31	32	IOCS16-
Addr 1	33	34	Ground
Addr 0	35	32	Addr 2
Chip Select 0-	37	38	Chip Select 1-
Activity	39	40	Ground

4-10   CHAPTER 4

CN1 : USB & PS/2 Mouse Connector(Reserved for the future)
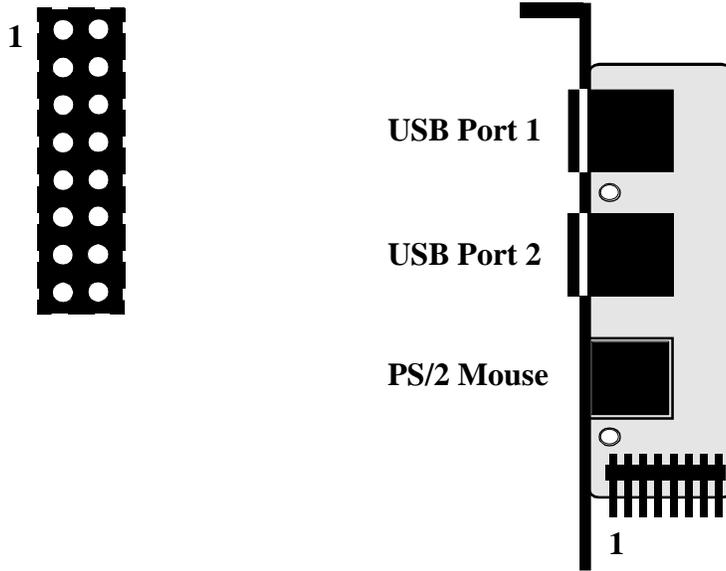
Figure 4-1 USB Port & PS/2 Mouse Adapter