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Chapter 1

Features of This Motherboard

The J-656HXA/J-656HXAP is designed for the PC user who wants a great many features in a small package. This motherboard:

- **Easy Installation:** Is equipped with BIOS supports auto detection of hard drives and plug and play to make setup of hard drives and expansion cards virtually automatic.

- **Intel chipset:** Intel's 430HX PCIset with I/O subsystems.

- **Multi-Speed Support:** Support one of 75~200Mhz Pentium CPU on a ZIF Socket 7.

- **L2 Cache:** Provides the option of 0KB upgradeable to 256KB or 512KB with Synchronous Cache Module, or on board 256KB upgradeable to 512KB, or on board 512KB Pipelined Burst SRAM.

- **Error Checking and Correcting (ECC):** Using Intel's 430HX PCIset and parity DRAM Modules can detect and correct 1 bit memory errors.

- **DRAM Memory Support:** Supports 72-pin SIMMs of 4MB, 8MB, 16MB, 32MB, or 64MB to from a memory size between 8MB to 384MB. Support both Fast Page Mode and Extended Data Output (EDO) SIMMs.

- **ISA and PCI Expansion Slots:** Provides four 16-bit ISA slots, three 32-bit PCI slots.

- **Super Multi-I/O:** Provides two high-Speed UART compatible serial ports and one parallel port with EPP and ECP capabilities. UART2 can also be directed to the Infrared Module for wireless connections. Two floppy drives of either 5.25" or 3.5" (1.44MB or 2.88MB) are also supported without an external card.

- **PCI Bus Master IDE Controller:** On-board PCI Bus Master IDE controller with two connectors that supports four IDE devices in two channels, provides faster data transfer rates, and supports Enhanced IDE devices such as Tape Backup and CD-ROM drives. This controller supports PIO Modes 3 and 4 and Bus Master IDE DMA Mode 2.

- **Optional IrDA and PS/2:** This motherboard supports an optional infrared port module for wireless interface and PS/2 mouse cable set.

Chapter 2

Installation

2-1 Map of the Motherboard

Figure 2-1

Jumpers

Connectors

Expansion Slots

2-2 Installation Steps

Before using your computer, you must follow the steps as follows:

1. Set Jumpers on the Motherboard
2. Install the CPU
3. Install DRAM Modules
4. Install Expansion card
5. Connect Cables, Wires, and Power Supply
6. Setup the BIOS Software

2-2-1 Jumper Settings

1. Flash ROM Voltage Selection: JP17 (Yellow color selector)
These jumpers set the voltage supplied to the Flash ROM. It depend on Flash ROM Brand.

Programming	JP17	
+12V	1-2	(Intel, MXIC)
+5V	2-3	(SST, Winbond)
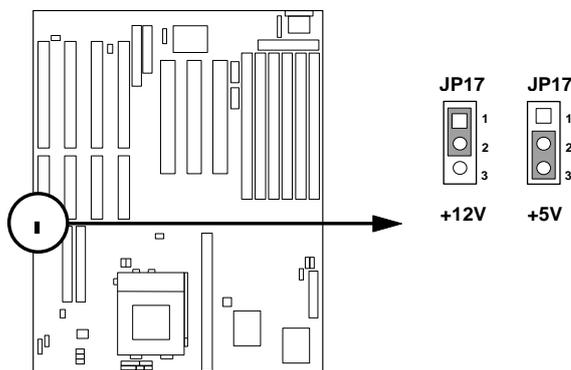
2. CPU External Clock (Bus) Frequency Selection: JP41 (White color selector)
These jumpers sets the clock generator what frequency to send to the CPU, These allow the selection of the CPU's **External** frequency (or **Bus Clock**).
The Bus Clock times the Bus Ratio equals the CPU's **Internal** frequency (the advertised CPU speed).

Selections	1-2	3-4
50M	short	short
55M	open	open
60M	short	open
66M	open	short

3. CPU to Bus/Core Ratio: JP22, JP23 (Blue color selector)

These jumpers set the frequency ratio between the Internal frequency of the CPU and the External frequency (Bus Clock) within the CPU. These must be set together with the bellow jumpers CPU External (Bus) frequency Selection (JP41).

Selections	**JP22**	**JP23**
1.5x	open	open
2x	short	open
2.5x	short	short
3x	open	short

CPU External Clock (Bus) Frequency Selection

CPU: (Bus) Frequency Ratio (1.5x, 2x, 2.5x, 3x)
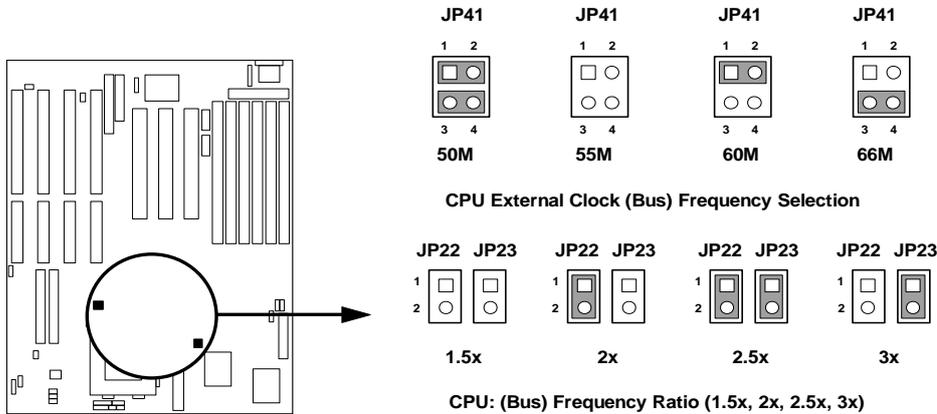
Set jumpers JP41, JP22, JP23 by the Internal speed of Intel CPU as follows:

CPU TYPE	Ratio	External Clock	JP41		JP22	JP23
			1-2	3-4		
P55C-200MHz P54C-200MHz	3.0x	66MHz	open	short	open	short
P55C-166MHz P54C-166MHz	2.5x	66MHz	open	short	short	short
P54C-150MHz	2.5x	60MHz	short	open	short	short
P54C-133MHz Cyrix 6X86 166+ IBM 6X86 166+	2.0x	66MHz	open	short	short	open
P54C-120MHz Cyrix 6X86 150+ IBM 6X86 150+	2.0x	60MHz	short	open	short	open
P54C-100MHz AMD K5-PR100 AMD K5-PR133	1.5x	66MHz	open	short	open	open
Cyrix 6X86-133+ IBM 6X86-133+	2.0x	55MHz	open	open	short	open
P54C-90MHz AMD K5-PR90	1.5x	60MHz	short	open	open	open
Cyrix 6X86-120+	2.0x	50MHz	short	short	short	open
P54C-75MHz	1.5x	50MHz	short	short	open	open

4. Voltage Regulator Output Selection:

J-656HXA only one Regulator Q2: JP32, JP33, JP33 (Yellow color selector)

Selections	JP32	JP33	JP34
3.3V	short	open	open
3.45V	open	short	open (Default)
3.52V	open	open	short

J-656HXAP Two Regulator Q1, Q2: JP32, JP33, JP34, JP27, JP28, JP29 (Yellow color selector)

CPU Core Voltage Selection:

Selections	JP32	JP33	JP34
2.8V	short	open	open
3.45V	open	short	open (Default)
3.52V	open	open	short

CPU I/O Voltage Selection:

Selections	JP27	JP28	JP29
3.3V	short	open	open
3.45V	open	short	open (Default)
3.52V	open	open	short

CPU TYPE				
Intel P55C	JP32	short	JP28	short
Intel P54C	JP33	short	JP28	short
AMD K5 ABQ (3.52V)	JP34	short	JP29	short
Cyrix 6x86 (3.52V)	JP34	short	JP29	short
IBM 6X86 (3.52V)	JP34	short	JP29	short

J-656HXA only one Regulator Q2

3.3V   3.45V   3.52V

J-656HXAP two Regulators Q1, Q2

CPU Core Voltage Selection   CPU I/O Voltage Selection

2.8V   3.45V   3.52V   3.3V   3.45V   3.52V
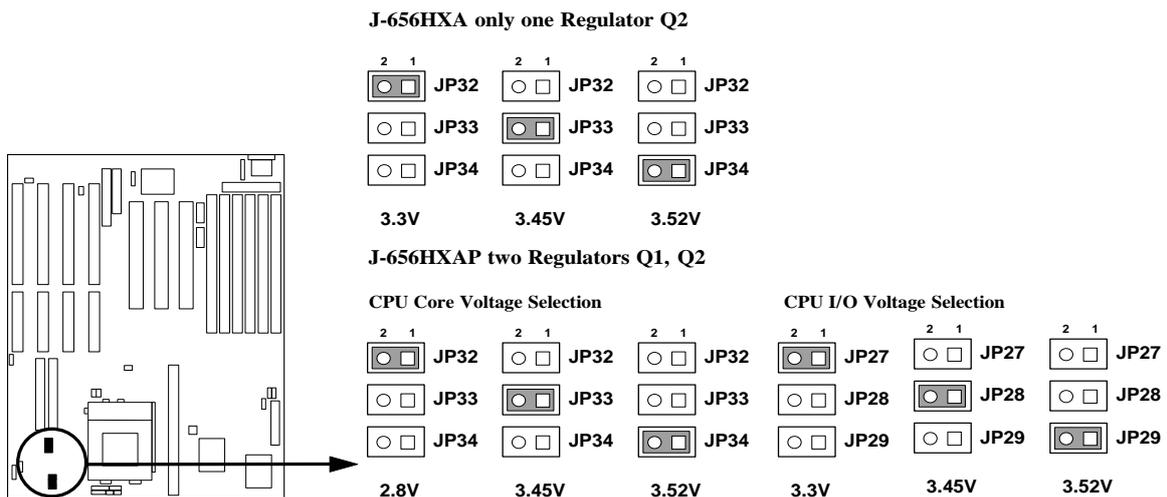
5. Monitor type select: JP2 (Black color selector)

Selections	JP2
Mono Card	open
CGA Card	short

JP2 [○ □]   JP2 [◑ □]
     2 1   2 1
  Mono Card   CGA Card
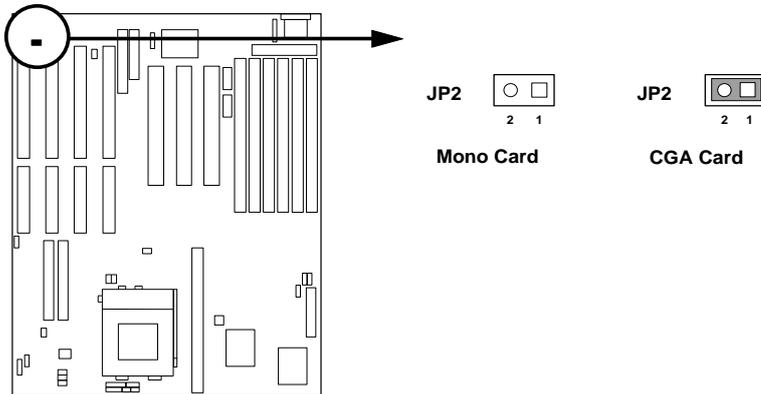
6. PS/2 Mouse on IRQ12 Setting: JPS1 (Black color selector)

JPS1 enables or disables the on-board PS/2 mouse lead connector. When Enabled, the port becomes active and uses IRQ12. See Page 23 for the "PS/2 Mouse connector".

JPS1
[▣] 1
[▣] 2
IRQ12 for PS/2 Mouse

JPS1
[□]
[○]
IRQ12 for ISA
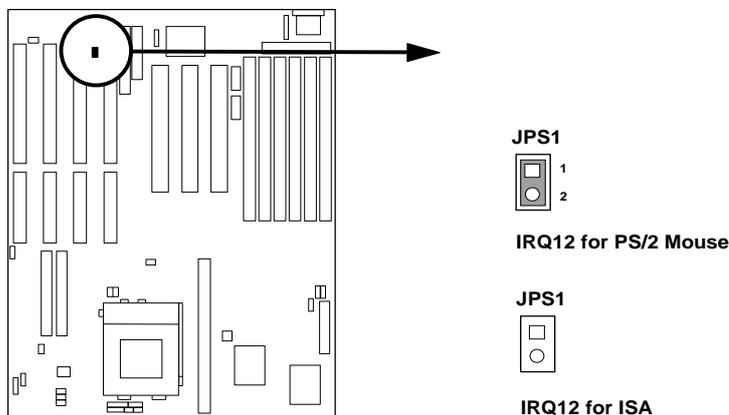
7. CMOS RAM (J12): Yellow color selector

This clears the user-entered information stored in the CMOS RAM chip such as hard disk information and passwords. Simply connect a jumper cap over this jumper for a few seconds then remove. But make sure that your computer is turned off. You must enter the BIOS setup (by holding down <DEL> during power-up) after this is done to re-enter BIOS information (see BIOS SETUP)

Selections	J12

Normal   2-3   (Default)
Clear CMOS   3-4   (momentarily)

J12   **J12**

Normal   **Clear Data**

CMOS RAM (Normal / Clear CMOS Data)
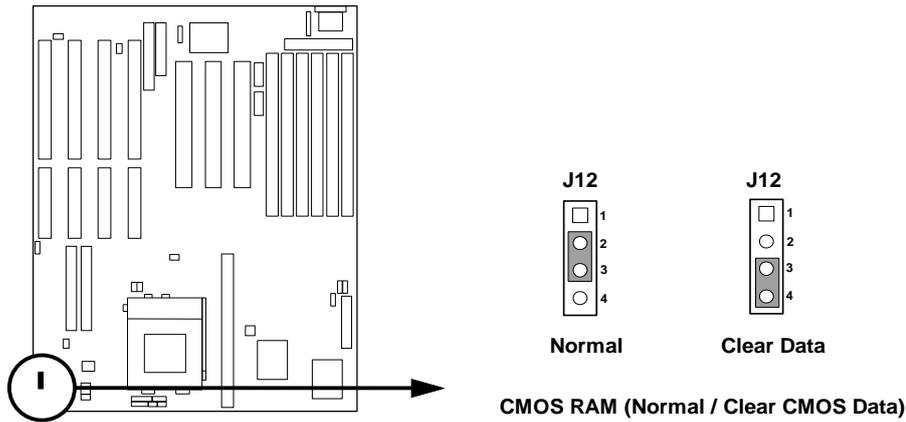
8. Level 2 Cache Size Setting: JP19, JP20, JP35 (Black color selector)

This jumper sets the total amount of L2 cache that is present. If you have two cache chips on-board, then you have either 256KB or 512KB. A "COAST" cache module can be used to upgrade the 256KB version to 512KB version. If there is no on-board cache, you must install a cache module of either 256KB or 512KB. Regardless of your cache combination, set the following jumpers according to the total amount of L2 cache that is present on-board and install as a module.

Selections	JP19	JP20	JP35
256K Cache	1-2	2-3	1-2
256K + Module 256KB	1-2	1-2	2-3

Total L2 Cache Size Setting (256KB/ 512KB)
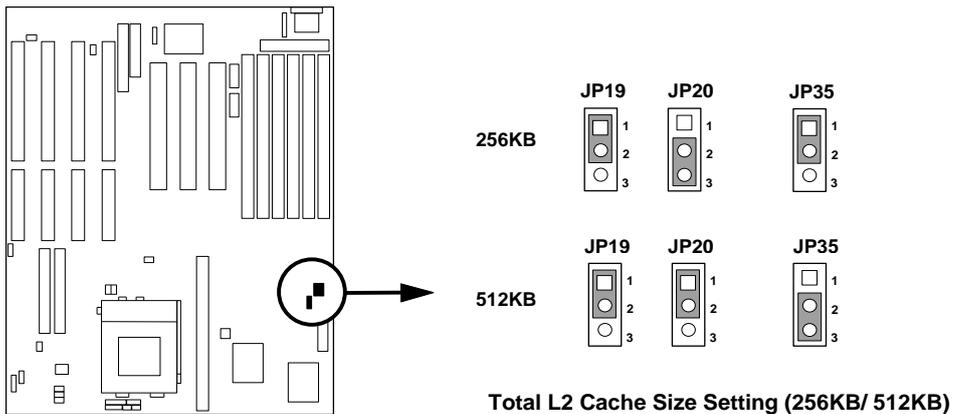
2-2-2 System Memory (DRAM)

This motherboard supports six 72-pin SIMMs of 4MB, 8MB, 16MB, 32MB, or 64MB to from a memory size between 8MB to 384MB. The DRAM can be either 60ns or 70ns Fast Page Mode or EDO RAM.

Install two memory modules each time as shown in the chart below.

Bank 0 SIMM 5 & 6	Bank 1 SIMM 3 & 4	Bank 2 SIMM 1& 2	Total Memory Combination
4MB x 2	None	None	8MB
8MB x 2	None	None	16MB
16MB x 2	None	None	32MB
32MB x 2	None	None	64MB
64MB x 2	None	None	128MB
4MB x 2	4MB x 2	None	16MB
4MB x 2	8MB x 2	None	24MB
4MB x 2	16MB x 2	None	40MB
4MB x 2	32MB x 2	None	72MB
4MB x 2	64MB x 2	None	136MB
4MB x 2	4MB x 2	4MB x 2	24MB
4MB x 2	4MB x 2	8MB x 2	32MB
4MB x 2	4MB x 2	16MB x 2	48MB
4MB x 2	4MB x 2	32MB x 2	80MB
4MB x 2	4MB x 2	64MB x 2	144MB
8MB x 2	4MB x 2	None	24MB
8MB x 2	8MB x 2	None	32MB
8MB x 2	16MB x 2	None	48MB
8MB x 2	32MB x 2	None	80MB
8MB x 2	64MB x 2	None	144MB
8MB x 2	8MB x 2	8MB x 2	48MB
8MB x 2	8MB x 2	16MB x 2	64MB
8MB x 2	8MB x 2	32MB x 2	96MB
8MB x 2	8MB x 2	64MB x 2	160MB

Bank 0 SIMM 5 & 6	Bank 1 SIMM 3 & 4	Bank 2 SIMM 1& 2	Total Memory Combination
16MB x 2	16MB x 2	None	64MB
16MB x 2	32MB x 2	None	96MB
16MB x 2	64MB x 2	None	160MB
16MB x 2	16MB x 2	4MB x 2	72MB
16MB x 2	16MB x 2	8MB x 2	80MB
16MB x 2	16MB x 2	16MB x 2	96MB
16MB x 2	16MB x 2	32MB x 2	128MB
16MB x 2	16MB x 2	64MB x 2	192MB
32MB x 2	32MB x 2	None	128MB
32MB x 2	64MB x 2	None	192MB
32MB x 2	32MB x 2	4MB x 2	136MB
32MB x 2	32MB x 2	8MB x 2	144MB
32MB x 2	32MB x 2	16MB x 2	160MB
32MB x 2	32MB x 2	32MB x 2	192MB
32MB x 2	32MB x 2	64MB x 2	256MB
64MB x 2	64MB x 2	None	256MB
64MB x 2	64MB x 2	4MB x 2	264MB
64MB x 2	64MB x 2	8MB x 2	272MB
64MB x 2	64MB x 2	16MB x 2	288MB
64MB x 2	64MB x 2	32MB x 2	320MB
64MB x 2	64MB x 2	64MB x 2	384MB

2-2-3 Level 2 External Static RAM (SRAM) Cache

The motherboard you may purchase may have either 0KB, 256KB or 512KB on board. If you have two cache chips on-board then you have either 256KB or 512KB pipeline burst SRAM cache, "COAST" cache module can be used to upgrade the 256KB version to 512KB.
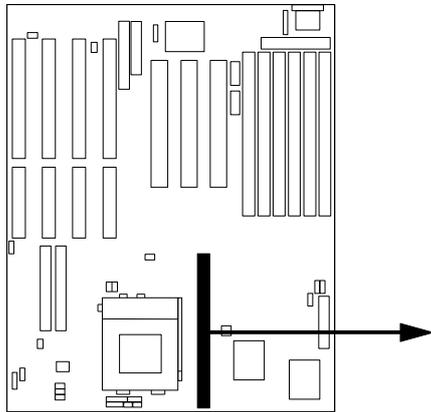
256KB PB Cache Module

2-3 Central Processing Unit (CPU)

The motherboard provides a 321-pin ZIF Socket 7. The CPU that came with the motherboard sould have a fan attached to it to prevent overheating. If this is not the cae then purchase a fan before you turn on your system.

> *WARNING: Without a fan, the CPU can overheat and cause damage to both the CPU and the motherboard.*

To install a CPU, first turn off your system and remove its cover. Locate the ZIF socket and open it by first pulling the lever sideways away from the socket then upwards to a 90-degree right angle. Insert the CPU with the white dot as your guide. The white dot should point towards the end of the level. The CPU has a corner pin for three of the four corners, the CPU will only fit in the one orientation as shown. With the added weight of the CPU fan, no force is required to insert the CPU. Once completely inserted, hold down on the fan and close the socket's lever.

> *IMPORTANT: You must set jumpers JP22 & JP23 "CPU to Bus frequency Ratio" on and jumpers JP41 "Bus Frequency Selection" on page 4 depending on the CPU that you install.*

Socket 7

Socket 7

intel® pentium

← Lever

← White Dot

← Lock

← Blank

CPU ZIF Socket 7
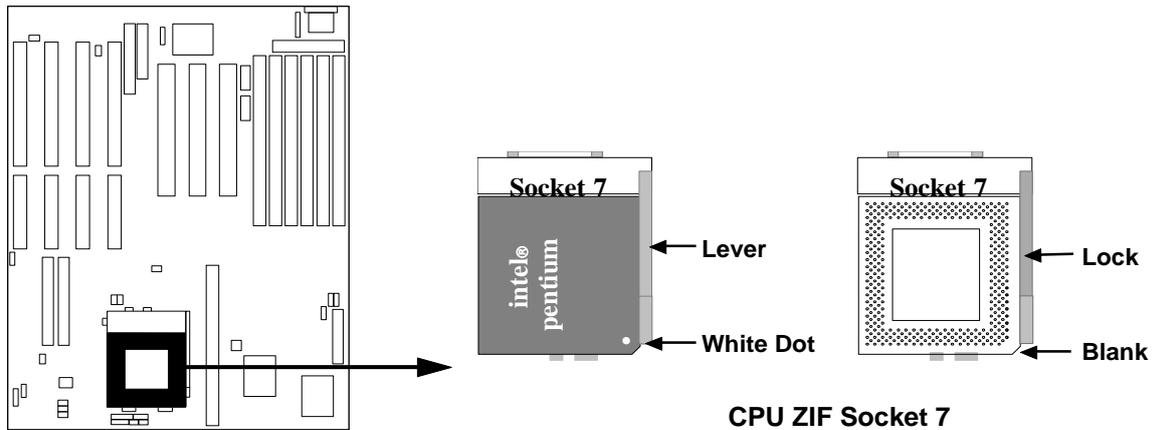
2-4 Expansion Cards

First read your expansion card documentation on any hardware and software settings that may be required to setup your specific card.

Installation Procedure:

1. Read the documentation for your expansion card.
2. Set any necessary jumpers on your expansion card.
3. Remove your computer's cover.
4. Remove the bracket on the slot you intend to use.
5. Carefully align the card's connectors and press firmly.
6. Secure the card on the slot with the screw you remove in step 4.
7. Replace the computer's cover.
8. Setup the BIOS if necessary.
9. Install the necessary software drivers for your expansion card.

Assigning IRQs for Expansion Cards

Some expansion cards need to use an IRQ to operate. Generally an IRQ must be exclusively assigned to one use. In an standard design three are 16 IRQs available but most of them are already in use by parts of the system which leaves 6 free for expansion cards.

Both ISA and PCI expansion cards may need to use IRQs. System IRQs are available to cards installed in the ISA expansion but first, and any remaining IRQs are then used by PCI cards. Currently, there are two types of ISA cards. The original ISA expansion card design, now referred to as "Legacy" ISA cards, requires that you configure the card's jumpers manually and then install it in any available slot on the ISA bus. You may use Microsoft's Diagnostic (MSD.EXE) utility included in the Windows directory to see a map of your used and free IRQs. For Windows

95 users, the "Control Panel" icon in "My Computer", contains a "System" icon which gives you "Device Manager" tab. Double clicking on a specific device give you "Resources" tab which shows the Interrupt number and address. Make sure that no two devices use the same IRQs or your computer will experience problems when those two devices are in use at the same time.

To simplify this process this motherboard has complied with the Plug and Play (PNP) specification which was developed to allow automatic system configuration whenever a PNP-compliant card is added to the system. For PNP cards, IRQs are assigned automatically from those available.

If the system has both Legacy and PNP ISA cards installed, IRQs are assigned to PNP cards from those not used by Legacy cards. The PCI and PNP configuration of the BIOS setup utility can be used to indicate which IRQs are being used by Legacy cards. For older Legacy cards that does not work with the BIOS, you can contact your vendor for an ISA Configuration Utility.

An IRQ number is automatically assigned to PCI expansion cards after those used by Legacy and PNP ISA cards. In the PCI bus design, the BIOS automatically assigns an IRQ to a PCI slot that has a card in it that requires an IRQ. To install a PCI card, you need to set something called the INT (interrupt) assignment. Since all the PCI slots on this motherboard use an INTA #, be sure that the jumpers on your PCI cards are set to INT A.

Assigning DMA Channels for ISA Cards

Some ISA cards, both Legacy and PNP may also need to use a DMA (Direct Memory Access) channel. DMA assignments for this motherboard are handled the same way as the IRQ assignment process described above. You can select a DMA channel in the PCI and PNP configuration section of the BIOS Setup utility. In the BIOS setup, you should choose "Yes" for those IRQ's and DMA's you wish to reserve for Legacy cards.

2-5 External Connectors

1. Power connector (12-pin block)

This connector connects to a standard 5 Volt power supply. To connect the leads from the power supply, ensure first that the power supply is not plugged. Most power supplies provide two plugs (P8 and P9), each containing six wires, two of which are black. Orient the connectors so that the black wires are located in the middle.

Using a slight angle, align the plastic guide pins on the lead to their receptacles on the connector. Once aligned, press the lead onto the connector until the lead locks into place.

Power Plugs from Power Supply

Power Connector on Motherboard
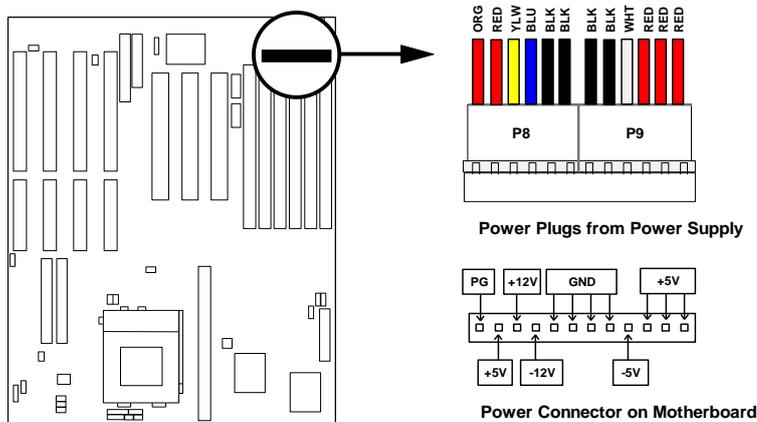
2. Keyboard Connector (5-pin female): J3

This connection is for a standard IBM-compatible keyboard. May also be known as a 101 enhanced keyboard.

Keyboard Connector (5-pin female)

Connector Plug from Keyboard
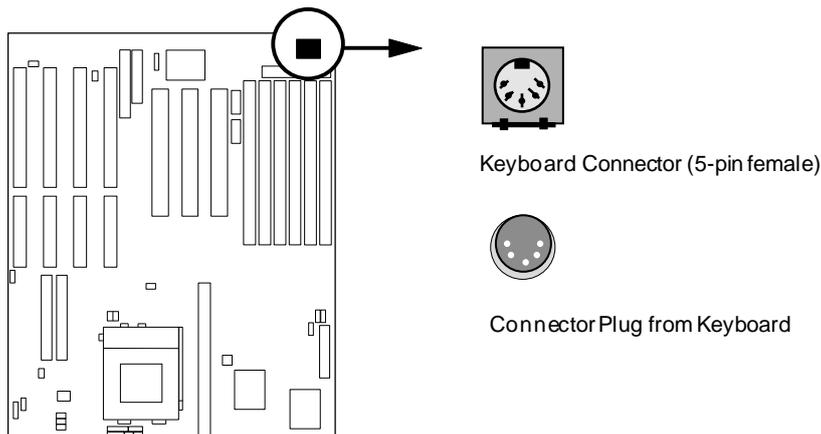
3. PS/2 Mouse Connector (6-pin block): J2

you are using a PS/2 mouse, you must purchase an optional PS/2 mouse set which connects to the 6 pin block and mounts to an open slot on your computer's case. You must also set "PS/2 Mouse Selection" on page 23 to enable the PS/2 Mouse.


```
1:  DATA
2:  NC
3:  GND
4:  VCC
5:  CLK
6:  NC
```

PIN 1

PS/2 Mouse Module Connector
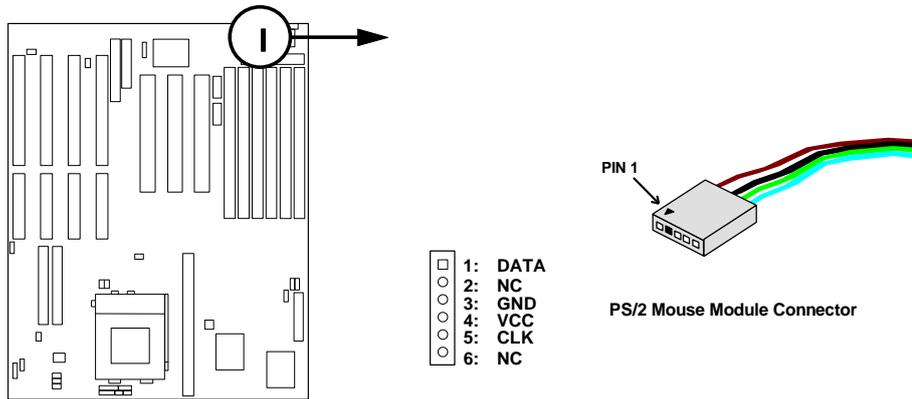
4. Parallel Printer Connector (26-pin Block): LPT

Connection for the included parallel port ribbon cable with mounting bracket. Connect the ribbon cable to this connection and mount the bracket to the case on an open slot. It will then be available for a parallel printer cable.

Note: Serial printers must be connected to the serial port. You can enable the parallel port and choose the IRQ through BIOS Setup on page 34 "Onboard Parallel Port".

Pin 1

Parallel Printer Connector
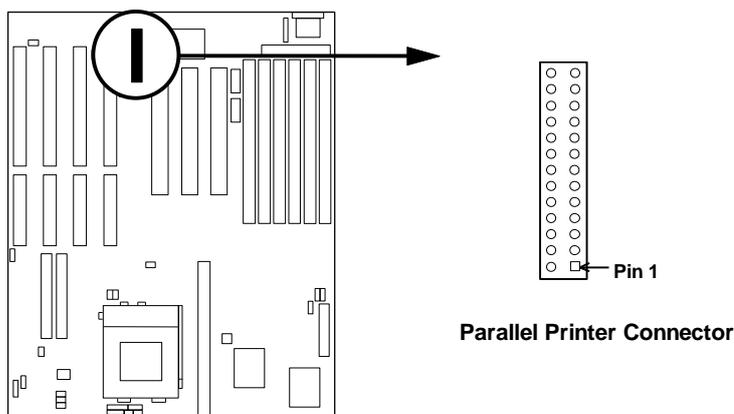
5. Serial port COMA and COMB Connector (Two 10-pin blocks)

These connectors support the provided serial port ribbon cables with mounting bracket. Connect the ribbon cables to these connectors and mount the bracket to the case on an open slot. The two serial ports on the mounting bracket will then be used for pointing devices or other serial devices. See page 34 for BIOS configuration of "Onboard Serial Port"
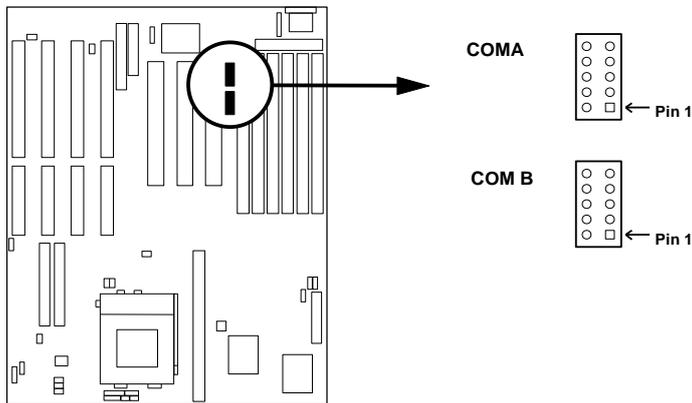
6. Floppy drive Connector (34-pin block): FDC

This connector supports the provided floppy drive ribbon cable. After connecting the single end to the board, connect the two plugs on the other end to the floppy drives.

Floppy Drive Connector
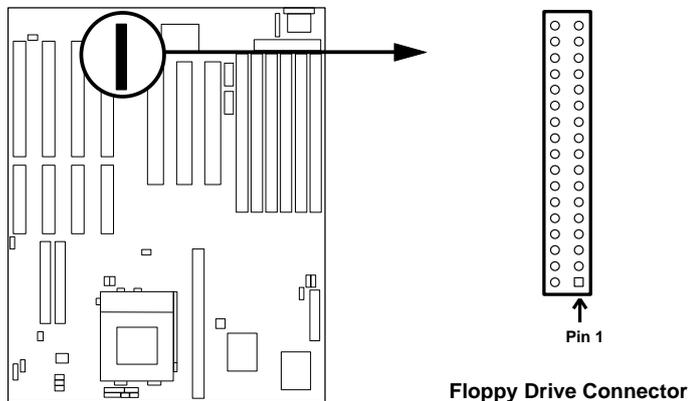
7. Primary IDE Connector (40-pin block): IDE1

This connector supports the provided IDE hard disk ribbon cable. after connecting the single end to the board, connect the two plugs at the other end to your hard disk(s). If you install two hard disks, you must configure the second drive to Slave mode by setting its jumpers accordingly. Please refer to the documentation of your hard disk for the jumper settings. See the figure below.

Primary IDE Connector
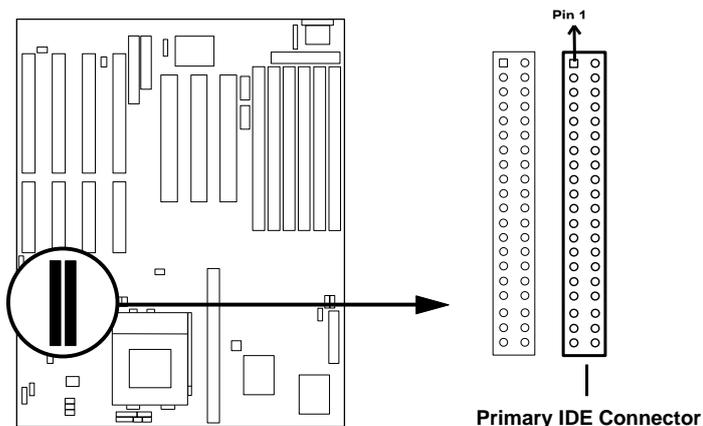
8. Secondary IDE Connector (40-pin block): IDE2

This connector connects to the next set of Master and Slave hard disks. Follow the same procedure described for the primary IDE connector. You may also configure two hard disks to be both Masters using one ribbon cable on the primary IDE connector and another ribbon cable on the secondary IDE connector.

Secondary IDE Connector
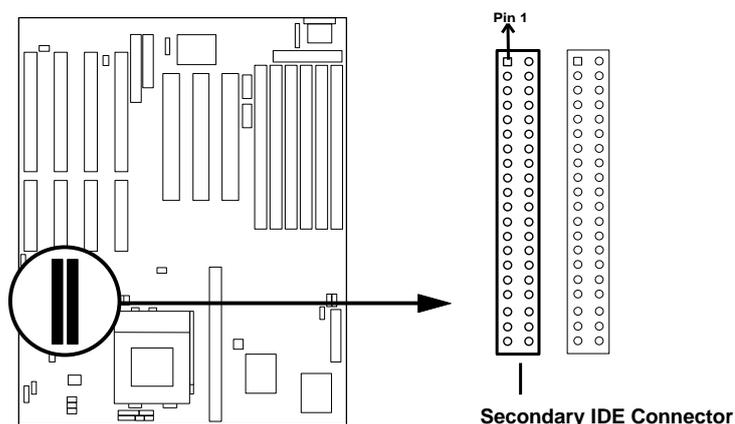
9. SMI suspend switch lead (JP16)

This allows the user to manually place the system into a suspend mode or "Green" mode where system activity will be instantly decreased to save electricity and expand the life of certain components when the system is not in use. This 2-pin connector (see the figure below) connects to the case-mounted suspend switch. If you do not have a switch for the connector, you may use the "Turbo Switch" since it does not have a function. SMI is activated when it detects a *short to open* moment and therefore leaving it shorted will not cause any problems. May require one or two pushes depending on the position of the switch. Wake-up can be controlled by settings in the BIOS but the keyboard

will always allow wake-up (the SMI lead cannot wake-up the system). If you want to use this connector, "Suspend Switch" in the POWER MANAGEMENT SETUP of the BIOS software should be on the default setting of *Enable* (see page 28).

Selections	JP16
Enter suspend mode	short
Normal	open

JP16   2 1   JP16   2 1

Enter suspend mode   **Normal**
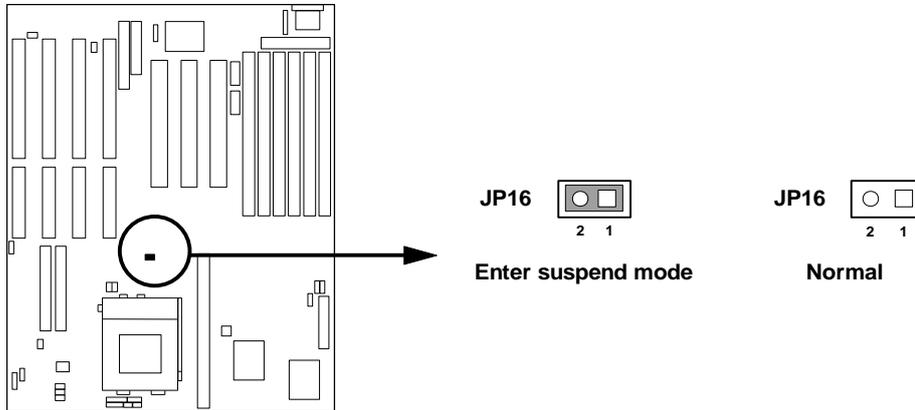
10. Turbo LED switch (LED)

The motherboard's turbo function is always on. The turbo LED connection is labeled here but the LED will remain constantly lit while the system power is on. You may wish to connect the Power LED from the system case to this lead. See the figure on page 19.

11. Reset switch lead (RESET)

This 2-pin connector connects to the case-mounted reset switch for rebooting your computer without having to turn off your power switch. This is a preferred method of rebooting in order to prolong the life of the system's power supply. See the figure below.

12. Keyboard lock switch lead (KEYLOCK)

This 5-pin connector connects to the case-mounted key switch for locking the keyboard for security purposes. See the figure below.

13. Speaker connector (SPK)

This 4-pin connector connects to the case-mounted speaker.

14. IDE activity LED (HDLED)

This connector connects to the hard disk activity indicator light on the case.

System Case Connections
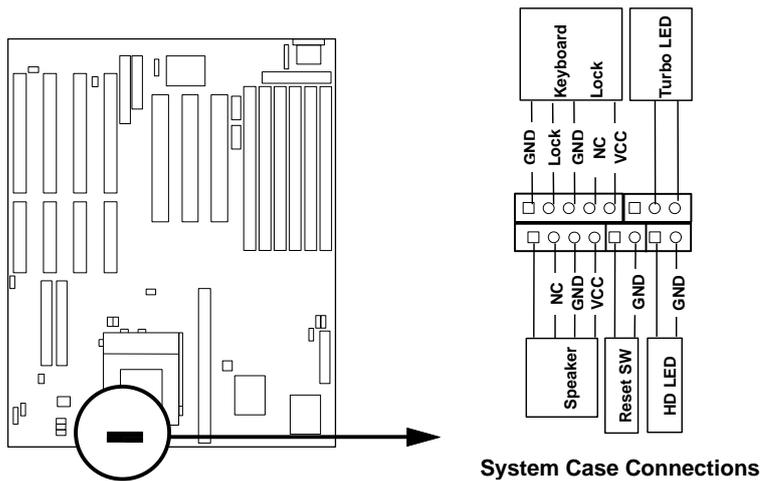
15. CPU cooling fan connector (JP36)

This connector supports a CPU cooling fan of 500mAMP (6WATT) or less. Depending on the fan manufacturer, the wiring may be different. The red wire should be positive, while the black should be ground. Connect the fan to the board taking into consideration the polarity of the connector.

WARNING: Damage may occur to the motherboard and/or the CPU fan if these pins are incorrectly used.

CPU Fan Power
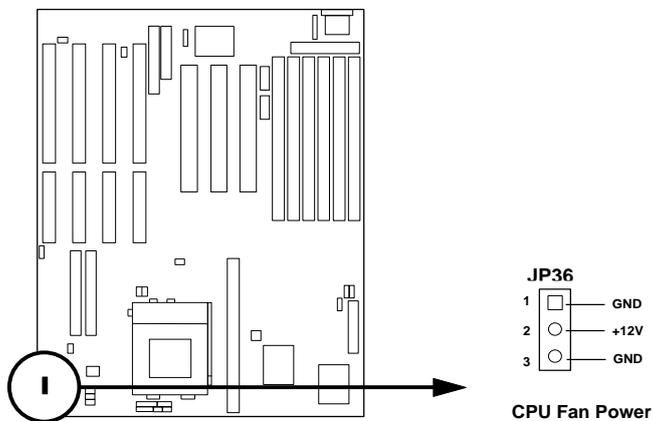
16. IR infrared module connector (JP37)

This connector supports the optional wireless transmitting and receiving infrared module. This module mounts to small opening on system cases that support this feature. You must also configure the setting through BIOS setup on page 32 to select HPSIR/ASKIR. Use the four pins as shown on the Back View and connect a ribbon cable from the module to the motherboard according to the pin definitions.

JP37

→ IRTX
→ GND
→ IRRX
→ VCC

Infrared Module Connector

Chapter 3
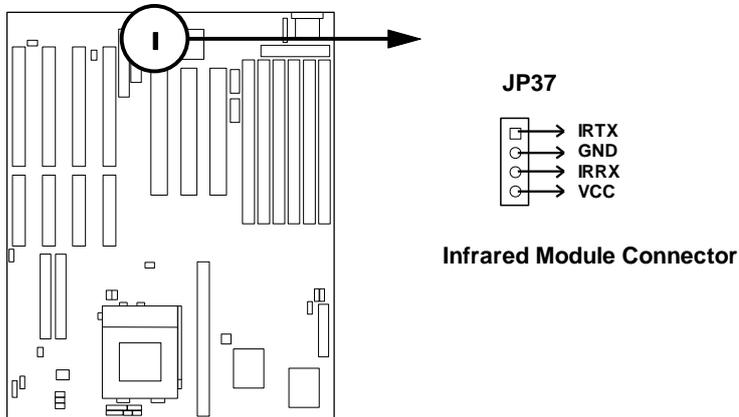
AWARD BIOS SETUP

Award's ROM BIOS provides a built-in Setup program which allows user 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 here is configuration change in the system, such as hard drive replacement or new equipment is installed.

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 Program

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

```
                    ROM PCI/ISA BIOS (2A59FJ1A)
                        CMOS SETUP UTILITY
                       AWARD SOFTWARE, INC.
 ┌─────────────────────────────────────────────────────────────────┐
 │  STANDARD CMOS SETUP          INTEGRATED PERIPHERALS             │
 │                                                                 │
 │  BIOS FEATURES SETUP          SUPERVISOR PASSWORD               │
 │                                                                 │
 │  CHIPSET FEATURES SETUP       USER PASSWORD                     │
 │                                                                 │
 │  POWER MANAGEMENT SETUP       IDE HDD AUTO DETECTION            │
 │                                                                 │
 │  PNP/PCI CONFIGURATION        HDD LOW LEVEL FORMAT              │
 │                                                                 │
 │  LOAD BIOS DEFAULTS           SAVE & EXIT SETUP                 │
 │                                                                 │
 │  LOAD SETUP DEFAULTS          EXIT WITHOUT SAVING               │
 ├─────────────────────────────────────────────────────────────────┤
 │  Esc : QUIT               ↑ ↓ → ←    : Select Item             │
 │  F10 : Save & Exit Setup     (Shift) F2  : Change Color        │
 ├─────────────────────────────────────────────────────────────────┤
 │              Time, Date, Hard Disk Type...                      │
 └─────────────────────────────────────────────────────────────────┘
```

Figure 3-1

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 (Figure 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 (2A59FJ1A)
                        STANDARD CMOS SETUP
                        AWARD SOFTWARE, INC.
 ┌──────────────────────────────────────────────────────────────────────┐
 │ Date (mm:dd:yy) : Thu, May, 16  1996                                   │
 │ Time (hh:mm:ss) : 12 :  0 : 39                                         │
 │                                                                        │
 │ HARD DISKS        TYPE  SIZE  CYLS  HEAD  PRECOMP  LANDZ  SECTOR  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 : 1.2M , 5.25 in.      ┌─────────────────────────────────┐    │
 │ Drive B : None                 │    Base  Memory :    640K        │    │
 │                                │ Extended Memory :   7168K        │    │
 │                                │    Other Memory :    384K        │    │
 │ Video   : EGA/VGA              │                   ──────────     │    │
 │ Halt On : All Errors           │    Total Memory :   8192K        │    │
 ├────────────────────────────────┴─────────────────────────────────┴────┤
 │  Esc : Quit          ↑↓→← : Select Item        Pu/Pd/+/- : Modify      │
 │  F1  : Help          (Shift)F2: Change Color                           │
 └──────────────────────────────────────────────────────────────────────┘
```

Figure 3-2

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

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

3-2 BIOS FEATURES SETUP

Select 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 J-656HXA/J-656HXAP. Again, user can move the cursor by pressing direction keys and <PgDn> of <PgUp> keys to modify the parameters. Pressing [F1] key to display help message of the selected item.

This setup program also provide 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 (2A59FJ1A)
              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       : Dsiabled
 Quick Power On Self Test   : Disabled    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       : Dsiabled
 Boot Up Numlock Status     : On
 Boot Up System Speed       : High
 Gate A20 Option            : Fast
 Typematic Rate Setting     : Disabled
 Typematic Rate (Chars/Sec) : 6
 Typematic Delay (Msec)     : 250
 Security Option            : Setup
 PS/2 mouse function control: Disabled    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
                                          F6 : Load BIOS Defaults
                                          F7 : Load Setup Defaults
```

Figure 3-3

Note: The Security Option contians "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 the system boots up causing a warning message to appear when anything attempts to access the boot sector or hard disk partition table.

Disabled: No warning message to appear when anything 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 without Internal Cache then this item "CPU Internal Cache" will not be show.

  Enabled: Enable cachehis category speeds up Power On Self Test. (POST) after you power on the comp

  Disabled: Disable cache

- **Quick Power On Self Test:** This field speeds up the Power-On Self Test (POST) routine by skipping retesting a second, third, and forth time. Setup default setting for this field is Enabled. A complete test of the system is done on each test.

  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 flo ppy 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-the speed that the system will run at immediately after power up.

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

NOTE: The board default value is LOW in the field. Boot the system to   controller turbo or De-turbo by Onboard (Turbo Switch).

- **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 : 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 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 entered at the prompt.

NOTE: **To disable security, select PASSWORD SETTING at Main Menu and then you will be asked to enter password. Do not type anything and just press <Enter>, it will disable security. Once the security is disabled, the system will boot and you can enter Setup freely.**

- **PCI/VGA Palette Snoop**: Some display cards that are non-standard VGA such as graphics accelerators or MPEG Video Cards may not show colors properly. The setting *Enabled* should correct this problem. Otherwise leave this on the setup default setting of **Disabled**.

- **OS Select For DRAM > 64M**B: When using OS2 operating systems with installed DRAM of greater than 64MB, you need to *OS2* this option otherwise leave this on the setup default of **Non-OS2**.

- **Video BIOS Shadow:** It determines whether video BIOS will be copied to RAM, however, it is optional from chipset design. Video Shadow will increase the video speed.

  *Enabled***:** Video shadow is enabled

  *Disabled***:** Video shadow is disabled

- C8000 - CBFFF Shadow:

  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 (2A59FJ1A)
                       CHIPSET FEATURES SETUP
                        AWARD SOFTWARE, INC.
┌─────────────────────────────────────────────────────────────────────┐
│ Auto Configuration     : Enabled    Memory Parity/ECC Check  : Auto   │
│ DRAM Timing            : 70 ns      Single Bit Error Report  : Enabled│
│ DRAM RAS# Precharge Time : 3         L2 Cache Cacheable Size  : 64MB   │
│ DRAM R/W Leadoff Timing : 7/6       Chipset NA# Asserted     : Enabled│
│ DRAM RAS To CAS Delay  : 3          Pipeline Cache Timing    : Faster │
│ DRAM Read Burst (EDO/FPM : x333/x444                                  │
│ DRAM Write Burst Timing : x333                                        │
│ Turbo Read Leadoff     : Disabled                                     │
│ DRAM Speculative Leadoff : Enabled                                    │
│ Turn-Around Insertion  : Disabled                                     │
│ ISA Clock              : PCICLK/3                                      │
│                                                                       │
│ System BIOS Cacheable  : Disabled                                     │
│ Video BIOS Cacheable   : Disabled                                     │
│ 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 Special Featrures: Enabled  F6 : Load BIOS Defaults           │
│ DRAM ECC/PARITY Select  : Parity    F7 : Load Setup Defaults          │
└─────────────────────────────────────────────────────────────────────┘
```

Figure 3-4

- **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 to 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:** (leave on default setting)

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 (2A59FJ1A)
                  POWER MANAGEMENT SETUP
                  AWARD SOFTWARE, INC.
┌──────────────────────────────────┬──────────────────────────────────┐
│ Power Management  : Disabled      │ ** 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       │
│                                   │ IRQ6 (Floppy Disk)     : OFF      │
│ Doze Mode         : Disabled      │ IRQ7 (LPT 1)           : ON       │
│ Standby Mode      : Disabled      │ IRQ8 (RTC Alarm)       : OFF      │
│ Suspend Mode      : Disabled      │ IRQ9 (IRQ2 Redir)      : ON       │
│ HDD Power Down    : Disabled      │ IRQ10 (Reserved)       : ON       │
│                                   │ IRQ11 (Reserved)       : ON       │
│ ** Wake Up Events In Doze & Standby ** │ IRQ12 (PS/2 Mouse) : ON       │
│ IRQ3 (Wake-Up Event): ON          │ IRQ13 (Coprocessor)    : ON       │
│ IRQ4 (Wake-Up Event): ON          │ IRQ14 (Hard Disk)      : ON       │
│ IRQ8 (Wake-Up Event): ON          │ IRQ15 (Reserved)       : ON       │
│ IRQ12(Wake-Up Event): ON          │                                  │
│                                   ├──────────────────────────────────┤
│                                   │ Esc: Quit      ↑↓→←: Select Item │
│                                   │ F1 : Help         Pu/Pd/+/-: Modify│
│                                   │ F5 : Old Values    (Shift)F2 : Color│
│                                   │ F6 : Load BIOS Defaults           │
│                                   │ F7 : Load Setup Defaults           │
└──────────────────────────────────┴──────────────────────────────────┘
```

Figure 3-5

Again, user can move the cursor by pressing direction keys to the field need 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

- **Power Management mode selection:**

  *Disabled***:**   The system operates in NORMAL conditions (Non-GREEN), 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 item B shown below.

- **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 CPU is installed. The timer starts to count when "System Standby" mode timer timed out and no "PM Events" occurred. Valid range is from 1 minute up to 1 hour.

- **Video Off Method**

This field defines the video off features. Three options are available: **V/H SYNC + Blank", "DPMS" and Blank Only"**. The first option, which is the default setting, blanks the screen and turns off vertical and horizontal scanning; "DPMS" (acronym for Display Power management System) allows the BIOS to control the video display card if it supports the DPMS feature; "Blank Only" only blanks the screen. Use the latter for monitors that do not support the "Green" feature.

Take note that a screen saver software does not work with this feature. While the monitor is shut off, this software cannot display.

3-4-2 Description of the Green Functions

The J-656HXA/J-656HXAP supports HDD Power Down, Doze and standby power saving functions when Intel Pentium Processor CPU is installed. In addition, the suspend function is supported when the SMI (sleep ref. Figure 2-1 be closed to enter the green function). The detail description of these functions are provided in next page.

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 ran out of time. The system will not resume operation until either a read from or a write to HDD command is executed again.

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

Standby Mode
When the system standby mode timer ran 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 time 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 initial any PM Events to be "ON" or "OFF". When the system detects all of the ON events do not have any activity, it will start the system Doze timer first if the "Power Management" isn't "OFF". Once the system Doze timer 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 "ON" 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 time 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 "ON" event occurred.

- **IRQ3 to IRQ15**

You can set IRQs 3~15 individually. Activity detected from any enabled IRQ channel will wake up the system.

3-5 PNP/PCI CONFIGURATION SETUP

This "**PNP/PCI configuration**" option configures the PCI bus slots. All PCI bus slots on the system use INTA#, thus all installed PCI cards must be set to this value.

```
                    ROM PCI/ISA BIOS (2A59FJ1A)
                        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      Esc: Quit      ↑↓→←: Select Item
DMA-3  assigned to : PCI/ISA PnP      F1 : Help           Pu/Pd/+/-:Modify
DMA-5  assigned to : PCI/ISA PnP      F5 : Old Values   (Shift)F2 : Color
DMA-6  assigned to : PCI/ISA PnP      F6 : Load BIOS Defaults
DMA-7  assigned to : PCI/ISA PnP      F7 : Load Setup Defaults
```

Figure 3-6

IRQxx assigned to

These fields indicate whether or not the displayed IRQ for each field is being used by a Legacy (non-PnP) ISA card. Two options are available: "PCI/ISA PnP" and "Legacy ISA". The first option the default value, indicates either that the displayed IRQ is not used or an PCI/ISA PnP is being used to determine if an ISA card is using that IRQ. If you install a Legacy ISA card that requires a unique IRQ, and you are not using an PCI/ISA PnP, you must set the field for that IRQ to Legacy ISA.

For example: If you install a Legacy ISA card that requires IRQ10 lets say, then set "IRQ10 assigned to Legacy ISA".

DMAxx assigned to

These fields indicate whether or not the displayed DMA channel for each field is being used by a Legacy (non-PnP) ISA card.   Available options include: "PCI/ISA PnP" and "Legacy ISA". The first option, the deafult setting indicates either that the displayed DMA channel is not used or an PCI/ISA PnP being used to determine if an ISA card is using that channel. If you install a Legacy ISA card that requires a unique DMA channel, and you are not using an PCI/ISA PnP, you must set the field for that channel to "Legacy ISA".

3-6 INTEGRATED PERIPHERALS SETUP

```
                 ROM PCI/ISA BIOS (2A59FJ1A)
                    INTEGRATED PERIPHERALS
                    AWARD SOFTWARE, INC.
┌─────────────────────────────────────┬──────────────────────────────────┐
│ IDE HDD Block Mode      : Enabled    │                                  │
│ PCI Slot IDE 2nd Channel : Enabled   │                                  │
│ On-Chip Primary   PCI IDE: Enabled   │                                  │
│ On-Chip Secondary PCI IDE: Enabled   │                                  │
│ IDE Primary Master PIO  : Auto       │                                  │
│ IDE Primary Salve PIO   : Auto       │                                  │
│ IDE Secondary Master PIO : Auto      │                                  │
│ IDE Secondary Slave PIO : Auto       │                                  │
│                                      │                                  │
│ Onboard FDD Controller  : Enabled    │                                  │
│ Onboard Serial Port 1   : 3F8/IRQ4   │                                  │
│ Onboard Serial Port 2   : 2F8/IRQ3   │                                  │
│ UART 2 Mode             : ASKIR      │                                  │
│ IR Function Duplex      : Half       │                                  │
│ RxD , TxD Active        : Lo,Hi      │ Esc: Quit    ↑↓→←: Select Item   │
│ Onboard Parallel Port   : 378H/IRQ7  │ F1 : Help        Pu/Pd/+/-:Modify│
│ Onboard Parallel Mode   : ECP        │ F5 : Old Values  (Shift)F2: Color│
│ ECP Mode Use DMA        : 3          │ F6 : Load BIOS Defaults          │
│                                      │ F7 : Load Setup Defaults         │
└─────────────────────────────────────┴──────────────────────────────────┘
```

Figure 3-7

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 IDE: Disabled an Onboard Secondary 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 Disabled.
  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.

- **On-Chip Primary PCI IDE:** The default value is Enabled.
  Enabled: Enable On-Chip 1 st channel IDE port.
  Disabled: Disable On-Chip 1 st channel IDE port. When use On-card (PCI or ISA card) IDE connector.

- **On-Chip Secondary PCI IDE:** The default value is Enabled.
  Enabled: Enable On-Chip 2 nd channel IDE port.
  Disabled: Disable On-Chip 2 nd 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: BIOS will automatically detect the Onboard Secondary Slave PCI IDE HDD Accessing mode.

Mode0~4: Manually set the IDE Accessing mode.

- **Onboard FDD Controller:** The default value 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 Serial Port 1:** This field allows the user to sellect the serial port. The default value is COM1.

  COM1: Enable Onboard Serial port 1 and address is 3F8H.

  COM2: Enable Onboard Serial port 1 and address is 2F8H.

  COM3: Enable Onboard Serial port 1 and address is 3E8H.

  COM4: Enable Onboard Serial port 1 and address is 2E8H.

  Disabled: Disable Onboard SMC CHIP's Serial port 1.

- **Onboard Serial Port 2:** This field allows the user to sellect the serial port. The default value is COM2.

  COM1: Enable Onboard Serial port 2 and address is 3F8H.

  COM2: Enable Onboard Serial port 2 and address is 2F8H.

  COM3: Enable Onboard Serial port 2 and address is 3E8H.

  COM4: Enable Onboard Serial port 2 and address is 2E8H.

  Disabled: Disable Onboard SMC CHIP's Serial port 2.

- **UART 2 Mode:**

  HPIR: HP standard mode IR.

  ASKIR: ASK standard mode IR.

- **IR function duplex:**

  Half: Half duplex IR transfer mode in Half Duplex.

  Full: Full duplex IR transfer mode in Full Duplex.

- **RxD, TxD Active:** Select RxD & TxD active signal level.

- **Onboard Parallel port:** This field allows the user to select the LPT port. The default value is 378H.

  378H: Enable Onboard LPT port and address is 378H.

  278H: Enable Onboard LPT port and address is 278H.

  3BCH: Enable Onboard LPT port and address is 3BCH.

Disabled: Disable Onboard SMC CHIP's LPT port.

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

- **Onboard 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.

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 (2A59FJ1A)
                        CMOS SETUP UTILITY
                       AWARD SOFTWARE, INC.
```

STANDARD CMOS SETUP	INTEGRATED PERIPHERALS
BIOS FEATURES SETUP	SUPERVISOR PASSWORD
CHIPSET FEATURES SETUP	USER PASSWORD
POWER MANAGEMENT SETUP	**Load SETUP Default (Y/N)? Y** ION
PNP/PCI CONFIGURATION	T
LOAD BIOS DEFAULTS	SAVE & EXIT SETUP
LOAD SETUP DEFAULTS	EXIT WITHOUT SAVING

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

              Time, Date, Hard Disk Type...
```

Figure 3-8

3-8 CHANGE PASSWORD

To change the password, choose the "**PASSWORD SETTING**" option from the CMOS SETUP UTILITY menu and press **<Enter>**.

NOTE: Either "Setup" or "System" must be selected in the "Security Option" of the 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 or 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 (2A59FJ1A)
                       STANDARD CMOS SETUP
                       AWARD SOFTWARE, INC.
┌─────────────────────────────────────────────────────────────────┐
│ Date (mm:dd:yy): Thu, May, 16  1996                               │
│ Time (hh:mm:ss): 12 : 0 : 39                                      │
│                                                                   │
│ HARD DISKS        TYPE  SIZE  CYLS  HEAD  PRECOMP  LANDZ  SECTOR  MODE │
│ Primary Master   :                                                │
│ Primary Slave    :                                                │
│ Secondary Master :                                                │
│ Seconda ┌───────────────────────────────────────────────────┐    │
│         │   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 : Quit          ↑↓→← : Select Item      Pu/Pd/+/- : Modify │
│   F1  : Help          (Shift)F2: Change Color                    │
└─────────────────────────────────────────────────────────────────┘
```

Figure 3-9

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)
   x   no.  per sector       (  512)
              528 Megabytes
```

If user set this 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)
   x   bytes per sector       (  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.	HEAD	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. A reverse transformation process will be made inside INT 12h in order to access the right HDD address the right HDD address!

Maximum HDD size:

	no.	Cylinder	(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 INT 13h.

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

3-10 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.

3-11 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.

3-12 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 adapter
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-CDF	CGA adapter
3F0-3F7	FLOPPY DISK controller
3F8-3FF	SERIAL port-1

3-13 TIMER & 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

3-14 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

3-15 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

3-16 BIOS REFERENCE-POST CODES

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

Post	Name	Description
CO	Turn Off Chipset Cache	OEM Specific-Cache controller.
1	Processor Test 1	Processor Status (1 FLAGS) Verification. Tests the following processor status flags carry, zero, sign, overflow. The BIOS will set each of these flags, verify the are set, then turn each flag off and verify it is off.
2	Processor Test 2	Read/Write/Verify all CPU registers except SS, SP, and BP with data pattern FF and OO.
3	Initialize Chips	Disable NMI, PIE, AIE, UEI, SOWV. Disable video, parity checking, DMA. Reset math coprocessor. Clear all page registers, CMOS shutdown byte. Initialize timer 0, 1, and 2, including set EISA timer to a known state. Initialize DMA Controllers 0 and 1. Initialize interrupt controllers 0 and 1. Initialize EISA extended registers.
4	Test Memory Refresh Toggle	RAM must be periodically refreshed inorder to keep the memory from decaying. This function assures that the memory refresh function is working properly.
5	Blank video, Initialize keyboard	Keyboard controller initialization.
6	Reserved	
7	Test CMOS Interface and Battery Status	Verifies CMOS is working correctly, detects bad battery.
BE	Chipset Default Initialization	Program chipset registers with power on BIOS defaults.
C1	Memory presence test	OEM Specific-Test to size on-board memory.

C5	Early Shadow	OEM Specific-Early Shadow enable for fast boot.
C6	Cache presence test	External cache size detection.

8	Setup low memory	Early chip set initialization. Memory presence test. OEM chip set routines. Clear low 64K of memory. Test first 64K memory.
9	Early Cache Initialization	Cyrix CPU initialization. Cache initialization.
A	Setup Interrupt Vector Table	Initialization first 120 interrupt vectors with SPURIOUS_INT_HDLR and initialize INT 00h-1Fh according to INT_TBL
B	Test CMOS RAM Checksum	Test CMOS RAM Checksum, if bad, or insert key pressed, load defaults.
C	Initialize keyboard	Detect type of keyboard controller (optional) Set NUM_LOCK status.
D	Initialize Video Interface	Detect CPU clock. Read CMOS location 14h to find out type of video in use. Detect and Initialize Video Adapter.
E	Test Video Memory	Test video memory, write sign-on message to screen. Setup shadow RAM.Enable shadow according to Setup.
F	Test DMA Controller 0	BIOS checksum test. Keyboard detect and initialization.
10	Test DMA Controller 1	
11	Test DMA Page Registers	Test DMA Page Registers.
12-13	Reserved	
14	Test Timer Counter 2	Test 8254 Timer 0 Counter 2.
15	Test 8259-1 Mask Bits	Verify 8259 Channel 1 masked interrupts by alternately turning off and on the interrupt lines.
16	Test 8259-2 Mask Bits	Verify 8259 Channel 2 masked interrupts by alternately turning off and on the interrupt lines.

17	Test Stuck 8259's Interrupt Bits	Turn off interrupts then verify no interrupt mask register is on.
18	Test 8259 Interrupt Functionality	Force an interrupt and verify the interrupt occurred.
19	Test Stuck NMI Bits (Parity I/O Check)	Verity NMI can be cleared.
1A		Display CPU clock.
1B-1E	Reserved	
1F	Set EISA Mode	If EISA non-volatile memory checksum is good, execute EISA initialization. If not, execute ISA tests an clear EISA mode flag. Test EISA Configuration Memory Integrity (checksum & communication interface).
20	Enable Slot 0	Initialization slot 0 (System Board).
21-2F	Enable Slot 1-15	Initialize slot 1 through 15.
30	Size Base and Extended Memory	Size base memory from 256K to 640K and extended memory above 1MB.
31	Test Base and Extended Memory	Test base memory from 256K to 640K and extended memory above 1MB using various patterns. NOTE: This will be skipped in EISA mode and can be "skipped" with ESC key in ISA mode.
32	Test EISA Extended Memory	If EISA Mode flag is set then test EISA memory found in slots initialization. NOTE: This will be skipped in ISA mode and can be "skipped" with ESC key in EISA mode.
33-3B	Reserved	
3C	Setup Enabled	
3D	Initialize & install Mouse	Detect if mouse is present, initialize mouse, install interrupt vectors.
3E	Setup Cache Controller	Initialize cache controller.
3F	Reserved	
BF	Chipset Initialization	Program chipset registers with Setup values
40		Display virus protest disable or enable.
41	Initialize Floppy Drive & Controller	Initialize floppy disk drive controller and drives.
42	Initialize Hard Drive & controller	Initialize hard drive controller and any drives.

43	Detect & Initialize Serial/Parallel Ports	Initialize any serial and parallel ports (also game port).
44	Reserved	
45	Detect & Initialize Math Coprocessor	Initialize math coprocessor.
46	Reserved	
47	Reserved	
48-4D	Reserved	
4E	Manufacturing POST Loop or Display Messages	Reboot if Manufacturing POST Loop pin is set. Otherwise display any messages (i.e., any non-fatal errors that were detected during POST) and enter Setup.
4F	Security Check	Ask password security (optional).
50	Write CMOS	Write all CMOS values back to RAM and clear screen.
51	Pre-boot Enable	Enable parity checker. Enable NMI, Enable cache before boot.
52	Initialize Option ROMs	Initialize any option ROMs present from C8OOOh to EFFFFh. NOTE: When FSCAN option is enabled, will initialize from C8OOOh to F7FFFh.
53	Initialize Time Value	Initialize time value in 40h:BIOS area.
60	Setup Virus Protect	Setup virus protect according to Setup.
61	Set Boot Speed	Set system speed for boot.
62	Setup Num Lock	Setup Num Lock status according to Setup.
63	Boot Attempt	Set low stack. Boot via INT 19h.
B0	Spurious	If interrupt occurs in protected mode.
B1	Unclaimed NMI	If unmasked NMI occurs, display. Press F1 to disable NMI, F2 reboot.
E1-EF	Setup Pages	E1-Page 1, E2-Page 2, etc.
FF	Boot	