TABLE OF CONTENT

CHAPTER 1

CHAPTER 2

CHAPTER 3

CHAPTER 4

CHAPTER 1

Introduction

The J-656 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×255mm with four layer design technology.

Specification

- Intel Pentium Processor operating at 50/75, 60/90, 66/100, 60/120, 66/133, 60/150, 66/166MHz and P55C/P55CT with 321 ZIF socket 7, and scalability top accept faster Pentium Processors in the feature, also support Cyrix-P120$^+$, Cyrix-P150$^+$, Cyrix-P166$^+$, Cyrix-P200$^+$.

- Supports up to 128 MegaBytes DRAM(minimum of 8 MB) on board (72 Pins SIMM ×4), and BIOS auto DRAM/EDO RAM configuration.

- Supports both Fast Page DRAM or EDO DRAM SIMM.

- Intel 82430FX PCIset chipset.

- Supports Burst/Pipelined burst synchronous SRAM. The cache memory combination could be 256KB/512KB.

- Support Cache Module 256K/512K.

- 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 J-656 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 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.

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

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

CHAPTER 2
Hardware Design

2-1 Motherboard Layout

The J-656 is designed with Intel 82430FX PCIset chipset which is developped by INTEL Corporation to fully support Intel Pentium PCI/ISA system.

The Intel 82430FX PCIset chipset provides 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 J-656 layout is shown in <u>Figure 2-1</u> for user's reference. Care must be taken when inserting memory modules, inserting Intel P54C/P55C/P55CT processor, 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/P55C processor due to possible overheat.

J-656 supports minimum of 8MB of System Memory and maximum of 128MB while L2 Cache can be 256KB/512KB SRAM to increase system performance.

The J-656 support standard Fast Page or EDO (Extended Data Out or Hyper Page Mode) DRAM. The EDO DRAM is designed to improved the DRAM read performance (When L2 Cache is not installed).

The J-656 provides four 72-pins SIMM sites for memory expansion. The socket support 1M×32 (4MB), 2M×32 (8MB), 4M×32 (16MB), and 8M×32 (32MB) single-sided or double-sided SIMM modules. The memory timing requires 70 ns Fast page devices or 60ns EDO DRAM.

The J-656 supports Onboard two PCI IDE connectors, and detects IDE harddisk type by BIOS utility automatic.

The J-656 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.

● J-656C Layout
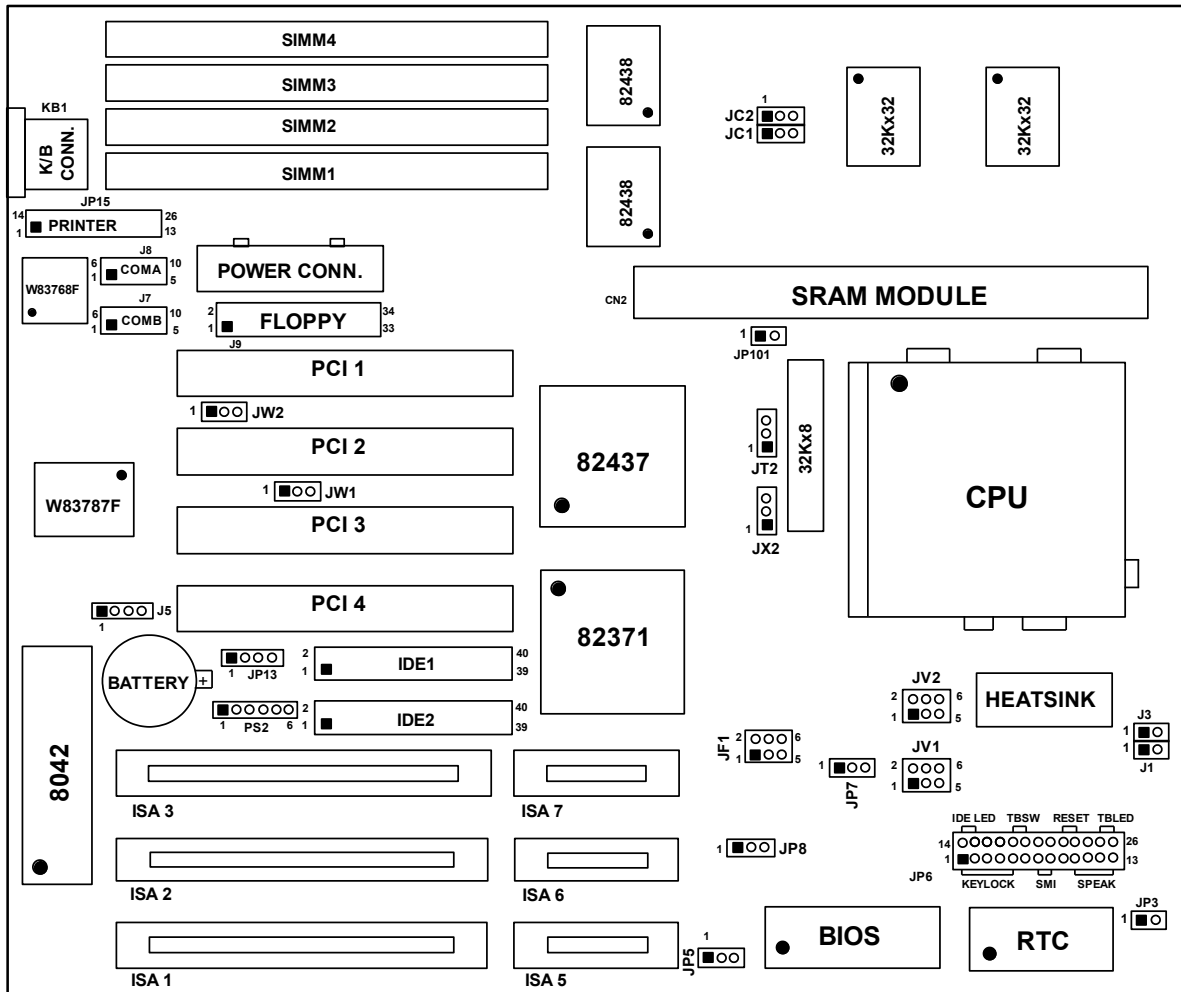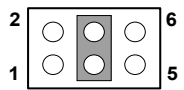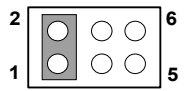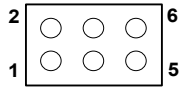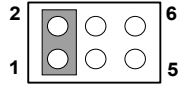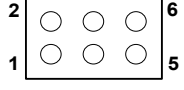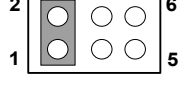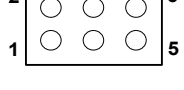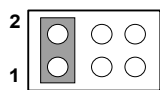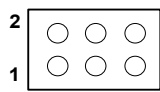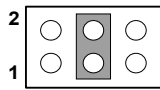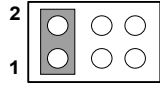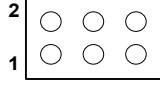
Figure 2-1

2-2 Jumpers and Connectors Setting
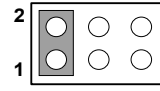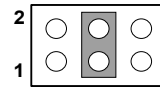
This section describes all of the connectors and jumpers equipped in the motherboard. Please refer to <u>Figure 2-1</u> for actual location of each connector and jumper.
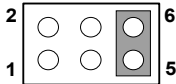
● CPU CLOCK JUMPER SETTING: JF1 (WHITE color selector)
J1, J3 (BLUE color selector)

CPU SPEED	JF1	J1	J3
P54C-75MHZ	3-4 closed	EMBED MSDraw \ * mergeformat open	EMBED MSDraw * mergeformat open
P54C-90MHZ	1-2 closed	EMBED MSDraw \ * mergeformat open	EMBED MSDraw * mergeformat open
P54C-100MHZ	open	EMBED MSDraw \ * mergeformat open	EMBED MSDraw * mergeformat open
P54C-120MHZ	1-2 closed	closed	EMBED MSDraw * mergeformat open
P54C-133MHZ	open	closed	EMBED MSDraw * mergeformat open
P54C-150MHZ	1-2 closed	closed	closed
P54C-166MHZ	open	closed	closed
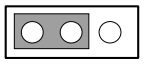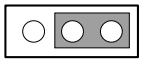
CPU SPEED	JF1	J1	J3
P54C-180MHZ	1-2 closed	EMBED MSDraw \ * mergeformat open	closed
P54C-200MHZ	open	EMBED MSDraw \ * mergeformat open	closed
CYRIX-P120+ (100MHZ)	3-4 closed	closed	EMBED MSDraw * mergeformat open
CYRIX-P150+ (120MHZ)	1-2 closed	closed	EMBED MSDraw * mergeformat open
CYRIX-P166+ (133MHZ)	open	closed	EMBED MSDraw * mergeformat open

● **CPU VOLTAGE SETTING: JV2   (YELLOW color selector)**
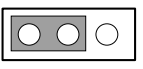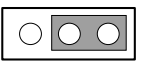
Voltage	JV2	Factory Default
3.3V	1-2 closed	
3.45V	3-4 closed	*

3.6V	2 ⊙ ○ ▣ 6 1 ○ ○ ▣ 5 **5-6 closed**	

● **CPU CLK TOLERANCE SETTING:** **JP7** **(YELLOW color selector)**

CPU CLK TOLERANCE	JP7	Factory Default
CPU CLK 5V tolerance	1 ▣ ▣ ○ 3 **1-2 closed**	*
CPU CLK 3.3V tolerance	1 ○ ▣ ▣ 3 **2-3 closed**	

● **ISA CLK SELECT:** **JP8** **(BLACK color selector)**
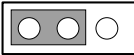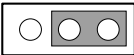
JP8	ISA CLK	Factory Default
1 ▣ ▣ ○ 3 **1-2 closed**	PCI CLK/3	
1 ○ ▣ ▣ 3 **2-3 closed**	PCI CLK/4	*

● **CMOS CLEAR SETTING:** **JP3** **(BLACK color selector)**

JP3	Function	Factory Default
▣ ▣	Clear CMOS	

closed		
EMBED MSDraw * mergeformat open	Normal	*

● BIOS TYPE SETTING: JP5 (YELLOW color selector)

BIOS TYPE	JP5
12V FLASH EPROM	1 ▢▢○ 3 1-2 closed
5V FLASH EPROM	1 ○▢▢ 3 2-3 closed

• **JP6**
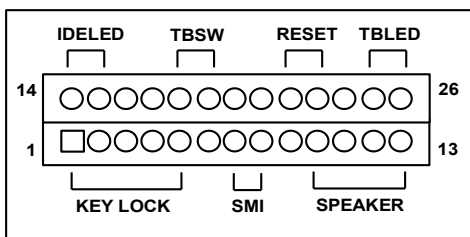
2-3 System Memory Configuration

The J-656 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 combinations.
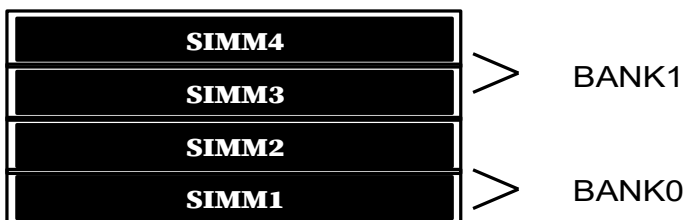
SIMM1,2 (BANK 0)	SIMM3,4 (BANK 1)	Total Size
1M × 32 (4 MB)	Empty	8MB
1M × 32 (4 MB)	1M × 32 (4 MB)	16MB

1M × 32 (4 MB)	2M × 32 (8 MB)	24MB
1M × 32 (4 MB)	4M × 32 (16 MB)	40MB
1M × 32 (4 MB)	8M × 32 (32 MB)	72MB
2M × 32 (8 MB)	Empty	16MB
2M × 32 (8 MB)	1M × 32 (4 MB)	24MB
2M × 32 (8 MB)	2M × 32 (8 MB)	32MB
2M × 32 (8 MB)	4M × 32 (16 MB)	48MB
2M × 32 (8 MB)	8M × 32 (32 MB)	80MB
4M × 32 (16 MB)	Empty	32MB
4M × 32 (16 MB)	1M × 32 (4 MB)	40MB
4M × 32 (16 MB)	2M × 32 (8 MB)	48MB
4M × 32 (16 MB)	4M × 32 (16 MB)	64MB
4M × 32 (16 MB)	8M × 32 (32 MB)	96MB
8M × 32 (32 MB)	Empty	64MB
8M × 32 (32 MB)	1M × 32 (4 MB)	72MB
8M × 32 (32 MB)	2M × 32 (8 MB)	80MB
8M × 32 (32 MB)	4M × 32 (16 MB)	96MB
8M × 32 (32 MB)	8M × 32 (32 MB)	128MB

NOTE: *1. J-656 support both Fast Page DRAM or EDO DRAM SIMMs, but they cannot be mixed within the same memory bank.*
       2. SIMMs may be parity (×36) or non parity (×32).
       3. The 70ns Fast Page Mode or 60ns EDO DRAM is necessary.

2-4 Cache Memory Configuration

The second level (L2) of cache is installed in the motherboard to increase the system performance. The J-656 supports different type of combinations for the cache installation. The cache ram module solution provides Onboard flexibility, allowing Onboard to accommodate 256KB and 512KB piplined burst synchronous SRAM modules. Jumper JC1,JC2,JX2,JT2 settings are used to Onboard's synchronous SRAM for differential such combinations. Please refer to following configurations for the details.

● **CACHE SIZE JUMPER SETTING:**   **JC1, JC2, JX2, JT2 (BLACK color selector)**

SIZE	JC1	JC2	JX2	JT2
On Board 256K	1-2 closed	1-2 closed	1-2 closed	1-2 closed
On Board 256K + Module 256K	2-3 closed	1-2 closed	1-2 closed	2-3 closed
On Board 0K + Module 256K	-	-	-	-
On Board 0K + Module 512K	-	-	-	-

"-" Means don't care.

- **SRAM Module Select: JP101 (YELLOW color selector)**

closed　　　ASYN SRAM Module

open　　　SYNC SRAM Module

2-5 Integrated PCI Bridge

The J-656 utilizes Intel's 82430 PCIset chipset to support Intel Pentium P54C/P54CS/P55C/P55CT Processor PCI/ISA system. The Intel 82430FX PCIset chipset consists of the 82437FX system controller (TSC), two 82438FX Data Path (TDP) devices, and one 82371FB PCI ISA/IDE Accelerator (PIIX) bridge chip. It provides an interface 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 J-656 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 configures 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.

However, if 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".

Second, you must be 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 plug the PCI/ISA IDE card into the system, you will 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 Figure 3-7 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 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 (2A59CJ19)
CMOS SETUP UTILITY
AWARD SOFTWARE, INC.

STANDARD CMOS SETUP	PASSWORD SETTING
BIOS FEATURES SETUP	IDE HDD AUTO DETECTION
CHIPSET FEATURES SETUP	HDD LOW LEVEL FORMAT
POWER MANAGEMENT SETUP	SAVE & EXIT SETUP
PCI CONFIGURATION SETUP	EXIT WITHOUT SAVING
LOAD BIOS DEFAULTS	
LOAD SETUP DEFAULTS	

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 (2A59CJ19)
STANDARD CMOS SETUP
AWARD SOFTWARE, INC.

```
Date (mm:dd:yy) : Mon, Aug, 14  1995
Time (hh:mm:ss) : 09 : 20 : 51

HARD DISKS      TYPE  SIZE  CYLS  HEAD  PRECOMP  LANDZ  SECTOR  MODE
Primary Master  : None    0    0    0      0      0      0 -----
Primary Slave   : None    0    0    0      0      0      0 -----
Secondary Master : None   0    0    0      0      0      0 -----
Secondary Slave  : None   0    0    0      0      0      0 -----


Drive A : 1.2M , 5.25 in.                  Base  Memory :  640K
Drive B : None                         Extended  Memory : 3168K
                                         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-656. 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 (2A59CJ19)

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
Memory Parity Check     : Disabled
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
                                          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 cache

Disabled: 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-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.*

● **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

ą 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 (2A59CJ19)

CHIPSET FEATURES SETUP

AWARD SOFTWARE, INC.

```
DRAM RAS# Precharge Time : 4          PCI Concurrency        : Enabled
DRAM R/W Leadoff Timing  : 8/6        PCI Streaming          : Enabled
DRAM RAS To Cas Delay    : 3          PCI Bursting           : Enabled
DRAM Read Burst Timing   : x2222      Onboard FDC Controller : Enabled
DRAM Write Burst Timing  : x3333      Onboard Serial Port 1  : COM1/3F8
                                      Onboard Serail Port 2  : COM2/2F8
System BIOS Cacheable    : Disabled   Onboard Parallel Port  : 378H
Video BIOS Cacheable     : Disabled   Onboard Parallel Mode  : Normal
8 Bit I/O Recovery Time  : 1
16 Bit I/O Recovery Time : 1
Memory Hole At 15M-16M   : Disabled
IDE HDD Block Mode       : Enabled
IDE Primary Master PIO   : Auto       Esc: Quit    ↑↓→←: Select Item
IDE Primary Slave PIO    : Auto       F1 : Help        Pu/Pd/+/-:Modify
IDE Secondary Master PIO : Auto       F5 : Old Values  (Shift)F2 : Color
IDE Secondary Slave PIO  : Auto       F6 : Load BIOS Defaults
On-Chip Primary PCI IDE  : Enabled    F7 : Load Setup Defaults
On-Chip Secondary PCI IDE: Enabled
PCI Slot IDE 2nd Channel : Enabled
```

Figure 3-4

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).

● **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.

- **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.

- **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 Primary PCI IDE:** The default value is Enabled.

Enabled: Enable Onboard 1 st channel IDE port.

Disabled: Disable Onboard 1 st 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 2 nd channel IDE port.

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

● **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.

● **PCI Concurrency:** The default value is Enabled

● **PCI Streaming:** The default value is Enabled

● **PCI Bursting:** The default value is Enabled.

Enabled: Enable PCI BUS Concurrency/Streaming/Bursting Access timing.

Disabled: Disable PCI BUS Concurrency/Streaming/Bursting Access timing.

● **Onboard FDC 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.

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

● **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 DMA Select:** This field allows the user to sellect DMA1 or DMA3 for ECP mode. The default value is DMA3.
DMA1:   The filed selects the rounting of DMA1 for the ECP mode.
DMA3:   The filed selects the rounting of DMA3 for the ECP mode.

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 (2A59CJ19)
POWER MANAGEMENT SETUP
AWARD SOFTWARE, INC.

Power Management : Disabled PM Control by APM : Yes Video Off Method : V/H SYNC+Blank Doze Mode : Disabled Standby Mode : Disabled Suspend Mode : Disabled HDD Power Down : Disabled IRQ3 (Wake-Up Event): ON IRQ4 (Wake-Up Event): ON IRQ8 (Wake-Up Event): ON IRQ12(Wake-Up Event): ON	IRQ3 (COM 2) : OFF IRQ4 (COM 1) : OFF IRQ5 (LPT 2) : OFF IRQ6 (Floppy Disk) : OFF IRQ7 (LPT 1) : OFF IRQ8 (RTC Alarm) : OFF IRQ9 (IRQ2 Redir) : OFF IRQ10 (Reserved) : OFF IRQ11 (Reserved) : OFF IRQ12 (PS/2 Mouse) : OFF IRQ13 (Coprocessor) : OFF IRQ14 (Hard Disk) : OFF IRQ15 (Reserved) : OFF
Power Down Activities COM Ports Accessed: ON LPT Ports Accessed: ON Drive Ports Accessed: 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.

3-4-2   Description of the Green Functions

The J-656 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 "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 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 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 "Enabled" event occurred.

3-5 PCI CONFIGURATION SETUP

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

WARNING: *Any misplacing IRQ could cause system hang up.*

ROM PCI/ISA BIOS (2A59CJ19)

PCI CONFIGURATION SETUP

AWARD SOFTWARE, INC.

PnP BIOS Auto-Config : Disabled Slot 1 Using INT# : AUTO Slot 2 Using INT# : AUTO Slot 3 Using INT# : AUTO Slot 4 Using INT# : AUTO 1st Available IRQ : 10 2nd Available IRQ : 11 3rd Available IRQ : 9 4th Available IRQ : 12 PCI IRQ Actived By : Level PCI IDE IRQ Map To : PCI-AUTO Primary IDE INT# : A Secondary IDE INT# : B	
	Esc: Quit ↑↓ → ←: Select Item F1 : Help Pu/Pd/+/-:Modify F5 : Old Values (Shift)F2 : Color F6 : Load BIOS Defaults F7 : Load Setup Defaults

Figure 3-6

PnP BIOS Auto-Config: This filed is Used to chose about the BIOS to set up the Legacy. ISA cards (ISA Card which do not have plug and play functions), PCI cards and ISA Plug and Play cards without conflicting, the default value is Disabled.

Enabled: The BIOS will depend upon information provided Plug and Play software (Configuration Manager and ISA Configuration Utility (ICU) to ensure that there are no conflict with Legacy ISA cards.

Note that run the ICU and provide the information of Legacy ISA cards. The ICU will update and save that information to the ESCD (Extend System Configuration Data). When your system is configured with ICU and they are used, then press the keyboard <CTRL> + <ALT> + <DEL> to performs a system software reset. Booting the computer and press <DEL> immediately to enter PCI configuration Setup and set the PnP BIOS Auto-Config: Enabled. These fileds (1st, 2nd, 3rd, 4th. Available IRQ: 10, 11, 9 and 12) below no display in this PCI Configuration Setup. Option the "SAVE & EXIT SETUP" bring to reboot the system.

Disabled: If Disabled is chose, then the user should not install and use Plug and Play software (Configuration Manager and ISA Configuration Utility (ICU)).

But the BIOS will depend upon these fileds (1st, 2nd, 3rd, 4th Available IRQ: 10, 11, 9 and 12) below selected by user to prevent conflicts between legacy ISA cards and Plug and Play cards.

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 Legacy card (described 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.
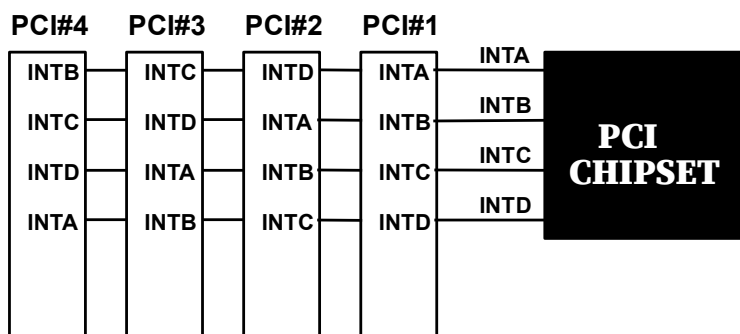
Figure 3-7 The Combination of PCI INT#lines

3-6 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 (2A59CJ19)
                        CMOS SETUP UTILITY
                       AWARD SOFTWARE, INC.
   ┌──────────────────────────────────────────────────────────────┐
   │   STANDARD CMOS SETUP           PASSWORD SETTING               │
   │                                                                │
   │   BIOS FEATURES SETUP           IDE HDD AUTO DETECTION         │
   │                                                                │
   │   CHIPSET FEATURES SETUP        HDD LOW LEVEL FORMAT           │
   │                                                                │
   │   POWER MANAGEMENT SETUP        SAVE & EXIT SETUP              │
   │                                                                │
   │   PCI CONFIGU      Load SETUP Default (Y/N)? Y      VING       │
   │                                                                │
   │   LOAD BIOS DEFAULTS                                           │
   │                                                                │
   │   LOAD SETUP DEFAULTS                                          │
   ├──────────────────────────────────────────────────────────────┤
   │   Esc : Quit              ↑ ↓ → ←           : Select Item      │
   │   F10 : Save & exit Setup      (Shift) F2 : Change Color       │
   ├──────────────────────────────────────────────────────────────┤
   │              Time, Date, Hard Disk Type...                    │
   └──────────────────────────────────────────────────────────────┘
```

Figure 3-8

3-7   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.

3-8   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 (2A59CJ19)
                 CMOS SETUP UTILITY
              AWARD SOFTWARE, INC.

 ┌──────────────────────────────────────────────────────────────┐
 │ Date (mm:dd:yy):Mon,Aug,14 1995                                │
 │ Time (hh:mm:ss):18:30:05                                       │
 │                                                                │
 │ HARD DISKS        Type   SIZE CYLS HEAD PRECOMP LANDZ SECTOR MODE│
 │ Primary Master :     Auto                                      │
 │ Primary Slave  :     Auto                                      │
 │ Secondary Master:    Auto                                      │
 │ Seconda┌──────────────────────────────────────────────┐       │
 │        │  Select Secondary Slave Option (N=Skip): N    │       │
 │        │                                               │       │
 │        │ OPTIONS SIZE CYLS HEAD PERCOMP LANDZ SECTOR MOD│      │
 │        │                                               │       │
 │        │  1(Y)  0  0  0   0   0   0 NORMAL             │       │
 │        │                                               │       │
 │        └──────────────────────────────────────────────┘       │
 │                                                                │
 │ Esc:Quit        ↑ ↓ → ←        :Select Item   PU/PD/+/-:Modify │
 │ F1 :Help         (Shift)F2 :Change Color                       │
 └──────────────────────────────────────────────────────────────┘
```
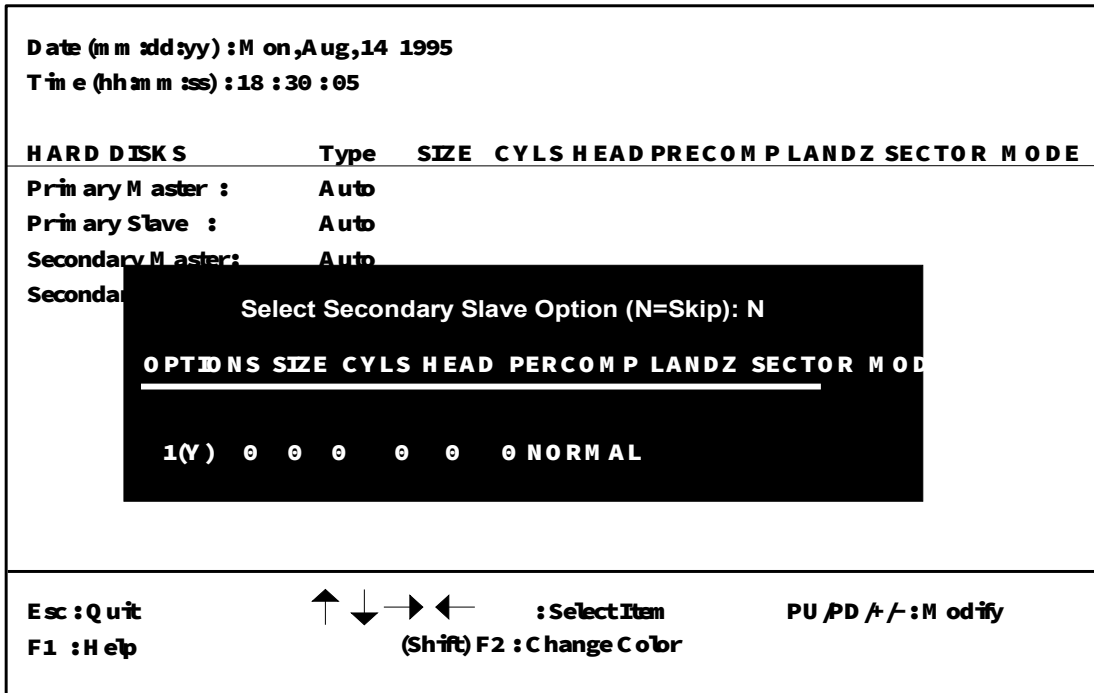
Figure 3-9

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. 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.	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.

3-9   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.

3-10   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.

3-11 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

3-12 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

3-13 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

3-14 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

3-15 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	

CHAPTER 4

TEST REPORT

4-1　SYSTEM CONFIGURATION :

CPU:

SERIES	VENDOR	SYSTEM CLOCK	PACKAGE 1.PGA, 2.PQFP 3.ON-BOARD
Pentium-120MHz	INTEL	100MHz	PGA

BIOS:

512K/1M	VENDOR	VERSION	DATE	WINBIOS/NORMAL
1M BYTE	AWARD	V4.5PG	08/01/95	NORMAL

DRAM:

TOTAL SIZE	VENDOR	SPEED	PACKAGE 72PIN,30PIN
16M BYTE	TI	70 NS	72PIN × 4

SRAM:

TOTAL SIZE	VENDOR	SPEED	WRITE BACK/ WRITE THROUGH
256K BYTE	SEC	15 NS	WRITE BACK

HDD:

SIZE	VENDOR/TYPE	INTERFACE CARD	DOS TYPE
850M BYTE	CONNER CFA850A	ONboard-IDEI	6.22

IDE/FDD:

TYPE	VENDOR	BUS TYPE	INTERFACE CARD	IDE1/IDE2
FDD	WINBOND	ISA	BUILD IN	

MONITOR:

MONO/VGA	VGA CARD	BUS SLOT TYPE	DRAM SIZE
VGA	S3-968	PCI	4M BYTE

4-2　EVELUATION SOFTWARE/PERFORMANCE

PROGRAM	VERSION	RESULT
SPEEDCOM	2.0	CPU: 692.64 FPU: 2008.69 VIDEO: 19660.00
LAND MARK SPEED	6.0	CPU: 1251.64 FPU: 2008.90 VIDEO: 19660.00
POWER METER SPEED	1.8	CPU MIPS: 59.2
NORTON SPEED	8.0	OVERALL PERFORMANCE: 250.0 CPU SPEED: 380.3

4-3 GENERAL UTILITY TEST

MS-DOS			
PROGRAM	VERSION	TIMES	RESULT PASS/FAIL
ET	3.51	2	PASS
CELEM CACHE TEST	1.0	4	PASS
QAPLUS	4.6	10	PASS
AUTO CAD	R10	12 min	PASS
AUTO CAD	R11	2	PASS
ORCAD	3.1	3	PASS

WINDOWS			
PROGRAM	VERSION	TIMES	RESULT PASS/FAIL
SPEEDY	1.0	2	PASS
DESIGER	3.01	2	PASS
QAPLUS FOR WINDOWS	5.0	2	PASS
WIN BENCH	3.11	2	PASS
WIN BENCH	4.0	2	PASS
WIN BENCH	95	2	PASS

4-4 SOFTWARE RELIABILITY TEST

STEP1.

PROGRAM	VERSION	LOOP/TIMES	RESULT/PASS FAIL
QAPLUS	4.52	3	PASS
QAPLUS	5.13	2	PASS
CHECKIT PRO	3.0	1	PASS
WINDOWS	3.1	3	PASS
WINSTON	95	4	PASS

STEP2.

PROGRAM	VERSION	TIMES	RESULT/PASS FAIL
OS/2 ENGLISH	3.0	2	PASS
INSTALL WINDOWS	3.1	3	PASS

STEP3.

PROGRAM	VERSION	TIMES	RESULT/PASS FAIL
DOS PC BENCH	8.0	1	PASS
DOS PC BENCH	'93	2	PASS

STEP4.

PROGRAM	VERSION	TIMES	RESULT/PASS FAIL
NETWARE	3.11	2	PASS
WINDOW NT	3.1	1	PASS
WINDOW NT CHINESE	3.5	2	PASS

STEP5.

PROGRAM	VERSION	TIMES	RESULT/PASS FAIL
SCO UNIX	V3.24	2	PASS

4-5 VGA CARD COMPATIABLE TEST

ISA-BUS	PASS/FAIL	MEMO
1. MX-86010FC 1M RAM	PASS	
2. WD-90C30LR 1M RAM	PASS	
3. TRIDENT 8900 1M RAM	PASS	
4. REALTEC 3105E 1M RAM	PASS	
5. WDC WD-90C11 1M RAM	PASS	
6. HM-86304 1M RAM	PASS	
7. ET-3000AX 1M RAM	PASS	
8. ET-4000AX 1M RAM	PASS	

PCI-BUS	PASS/FAIL	MEMO
1. S3 864 2M RAM	PASS	
2. TRIDENT 9440 AGI 2M RAM	PASS	
3. ET-4000 W32P 2M RAM	PASS	
4. CIRRUS 5434 2M RAM	PASS	
5. CIRRUS 5430 2M RAM	PASS	
6. AVANCE ALG 2301 2M RAM	PASS	
7. S3 968 4M RAM	PASS	

4-6 IDE-HDD COMPATIABLE TEST

PCI-BUS	PASS/FAIL	MEMO
1. CMD 640B	PASS	
2. ALI M5215	PASS	

4-7 SCSI-COMPATIABLE TEST

PCI-BUS	PASS/FAIL	MEMO
1. NCR 53C810	PASS	
2. Adaptec AIC-7870P	PASS	

4-8 NET WORK COMPATIABLE TEST

ISA-BUS	PASS/FAIL	MEMO
1. S9152DR	PASS	
2. UK0022 (YCL)	PASS	
3. S9212AF (GROUP-TEK)	PASS	
4. S9136AK	PASS	
5. UMC UM9003F	PASS	
6. DL2517B (DE-220CT)	PASS	
7. S9218AD	PASS	

4-9 SOUND CARD COMPATIABLE TEST

ISA-BUS	PASS/FAIL	MEMO
1. OPTI 929 (SOUND 16)	PASS	
2. SOUND Blaster Pro	PASS	

4-10 WINSTONE 95 PERFORMANCE

Configuration: Intel FX 586 M/B with Pentium P54C 100MHz CPU, AWARD BIOS,

VGA CARD S3-968 4M Byte RAM, HDD Conner CFA 850A : 850M Byte

DRAM 1. STD-FP 16M Byte 4M×72pin×4.   2. EDO 16M Byte 8M×72pin×2

SRAM 1. Asyn Winbond 256K-15.   2. Pipelinte burst SEC 256K-15