HOT-307H
386™-33/40 MAIN BOARD
USER'S MANUAL

Table of Contents

1 - 1 SPECIFICATION

CPU	Intel/AMD 80386DX, Cyrix/TI 486DLC
Coprocessor	80387DX or Weitek 3167 (Optional)
Chipset	OPTi 82C391B/392
Memory	1MB to 32MB
System Clock Drive	Clock Generator or Oscillator
RAM	256K, 1M, 4M SIMM
BIOS	AMI
I/O Slots	Six 16 bit slots One 8 bit slot
Shadow RAM	System BIOS & Video BIOS
Size	22 cm x 24 cm
Ambient Temperature	Operating : 0 °C to + 55 °C Static State : -30 °C to + 70 °C
Relative Humidity	0 to + 85% Noncondensing at + 55 °C
Altitude	0 to 10,000 feet
Vibration	Random variation 0 to 1000 Hz
Voltage	4.75 V to 5.25 V
Wattage Supply	≥ 200 W

* Support system running up to 33/40 MHz.

* Support Cyrix / TI 486DLC CPU.

* Up to 32 MB of local high speed page mode module RAM on-board.

* Cache memory designed with size of 32KB, 64KB, 128KB, 256KB selectable.

* Support two non-cacheable regions.

* Option for cacheable video BIOS.

* AT bus clock selectable from CLKIN/6 to CLKIN/10.

* 16-bit AT bus cycle selectable from 0 or 1 wait state.

* Hardware turbo switch for high or normal speed selectable.

* Socket for optional 80387 or Weitek 3167 coprocessor.

* AMI BIOS support.

* 2/3 baby size design, mechanically fit any baby AT or XT cases.

JP1

JP3

JP8

J10

1
2
3
4

8042 K/B controller

BIOS

BANK

BANK

1

0

82C391

82C392

80386DX
SOCKET

TAG   BANK 0   BANK 1

387/3167
SOCKET

JP11

● ● ●

3   2   1

1
2
3

JP7 JP6 JP10 JP5

J23   J24   SW2   SW1   JP4

● ● ● ● ●   ● ● ● ● ●   ● ●   ● ●   ● ●

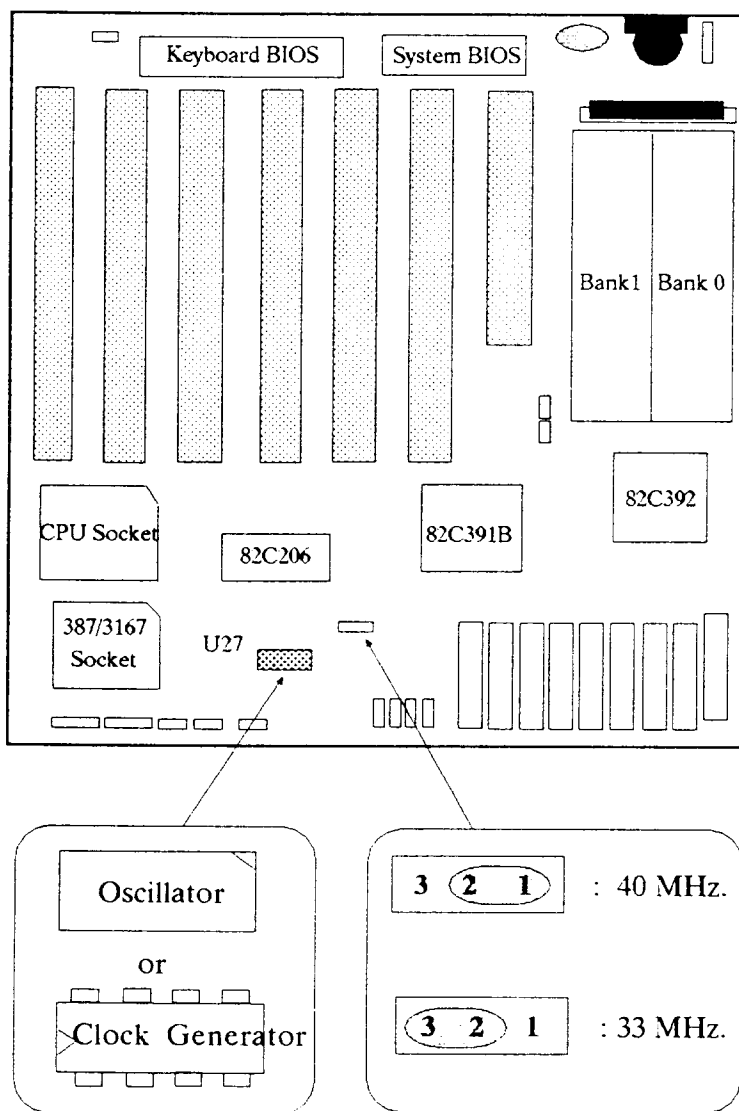KEYLOCK 1   SPEAKER 1   TURBO SW   RESET   TURBO LED
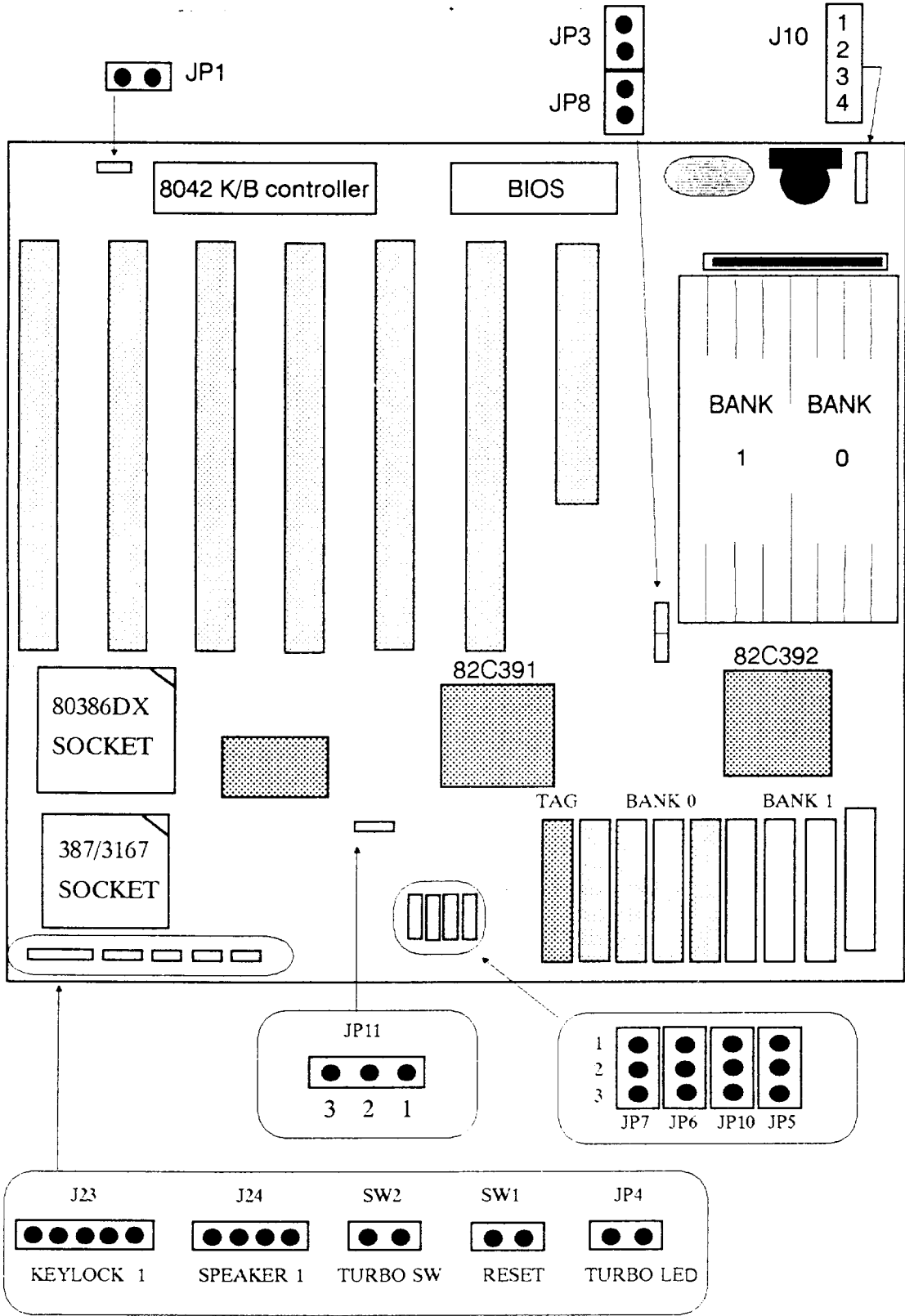
Chapter 2. Installation

2.1 SYSTEM CLOCK RATING JUMPER SETTING

HOT-307 main board provides a jumper to select either 33 MHz. or 40 MHz. system clock.

JP11 for above system clock ratings are shown as below.

Note : If *clock generator* on U27 is replaced by an *oscillator*, the user may ignore this section.
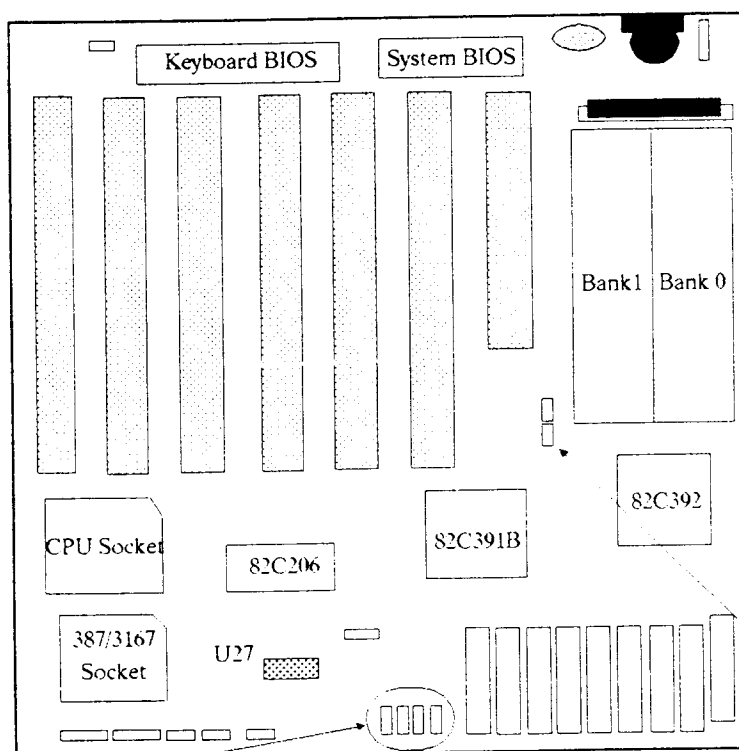
2.2.1 Cache Size Jumper Setting

HOT-307 main board supports 32KB, 64KB, 128KB and 256KB secondary cache memory size.

JP5, JP6, JP7, JP8, JP10 are provided for the setting of different cache size.

32 KB	64 KB	128 KB	256 KB
JP8 [1 / 2]	JP8 [1 / 2]	JP8 (1 / 2)	JP8 (1 / 2)
(1/2/3) (1/2/3) (1/2/3) (1/2/3)	(1/2/3) (1/2/3) (1/2/3) (1/2/3)	(1/2/3) (1/2/3) (1/2/3) (1/2/3)	(1/2/3) (1/2/3) (1/2/3) (1/2/3)
JP7 JP6 JP10 JP5	JP7 JP6 JP10 JP5	JP7 JP6 JP10 JP5	JP7 JP6 JP10 JP5

2.2.2 Cache RAM Installation

On the HOT-307 main board, Cache RAM and TAG RAM are spread into 9 sockets on board.

The Cache RAM are divided into Bank 0 and Bank 1, each Bank contain four pieces of SRAM. The user may assign the total capacity of Cache RAM from 32 KB to 256 KB.

The table below indicates the location and capacity of both Cache RAM and TAG RAM.

CACHE SIZE	CACHE RAM		TAG RAM
	BANK 0	BANK 1	
	U34,U35,U36,U37	U43,U44,U45,U46	U48
32KB	8K*8, 4 PCS	Not Install	8K*8
64KB	8K*8, 4 PCS	8K*8, 4 PCS	8K*8
128KB	32K*8,4 PCS	Not Install	8K*8
256KB	32K*8,4 PCS	32K*8,4 PCS	32K*8

Set the JP1 jumper depending on whether the user is using a monochrome (MGP) or color (CGA) display adaptor. If the user using an EGA or VGA adaptor, the JP1 setting is irrelevant.

HOT-307 provides JP3 for AT-Clock selection. The user may select AT-Clock either CLKIN/6 or CLKIN/8 by insert a jumper on JP3 or remove it.

JP1 Display Adaptor Setting

Close : Color

Open : Monochrome

JP3 AT-Clock Setting

Close : CLKIN/8 (Default)

Open : CLKIN/6
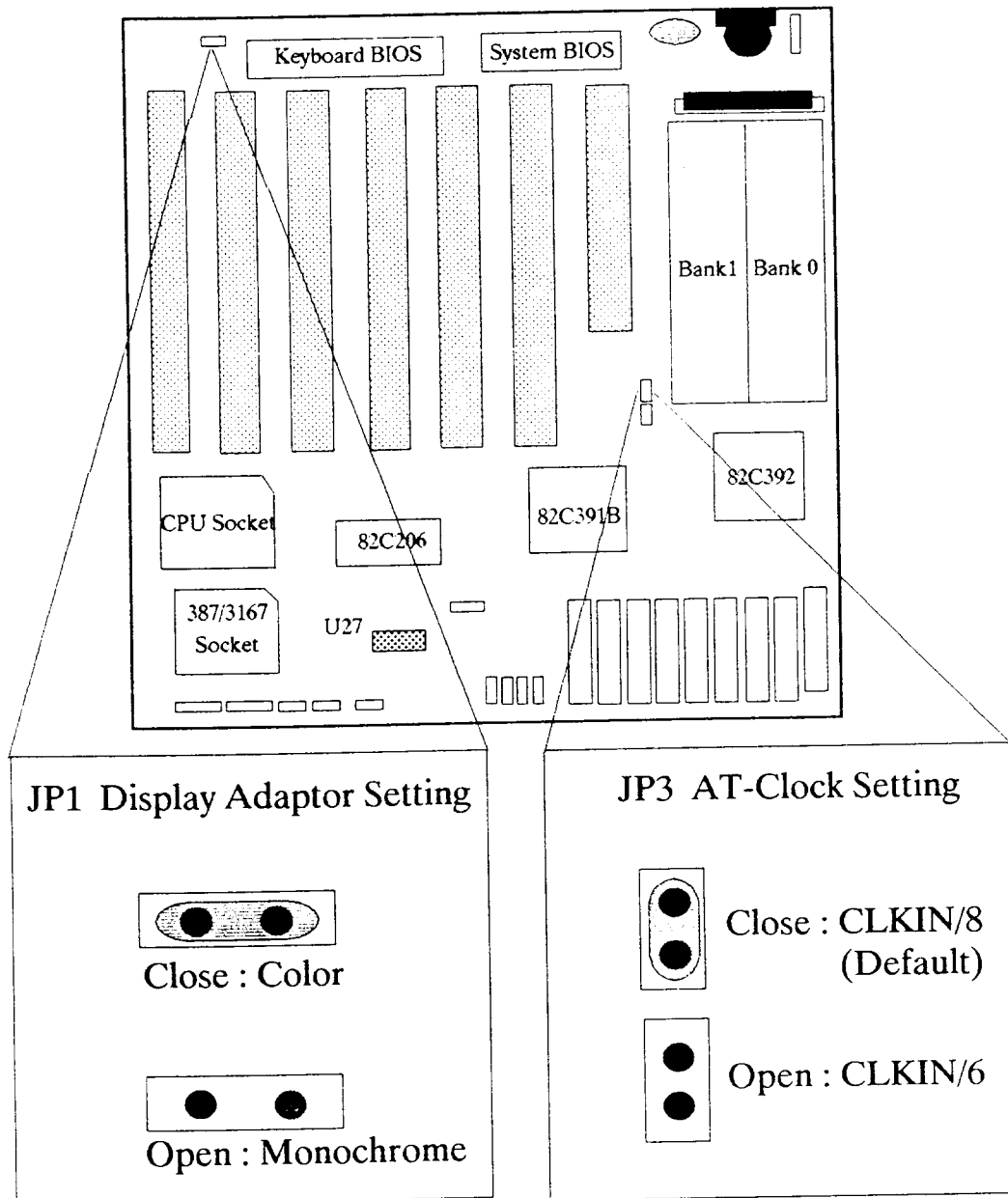
2.4 J11, J12 POWER CONNECTOR

The power supply cables connect to the white 12 pins connector.
The two power supply connectors can only fit on in one orientation,
and be sure to arrange the black wires are at the center.

PIN   Assignment

1	Power Good	7	GND
2	+ 5 V	8	GND
3	+ 12 V	9	- 5 V
4	- 12 V	10	+ 5 V
5	GND	11	+ 5 V
6	GND	12	+ 5 V
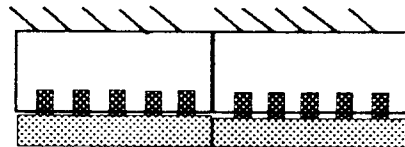
2.5 J1 KEYBOARD CONNECTOR

J1 is a 5 pins DIN connector. It supports the general case to con-
nect the keyboard cable jack.

PIN   Assignment

1	Keyboard CLK
2	Keyboard Data
3	NC
4	GND
5	+ 5 V
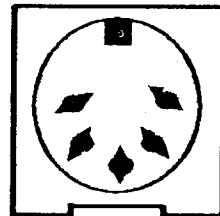
2 . 6 J10 EXTERNAL BATTERY CONNECTOR

The HOT-307 main board supports a internal battery to retain the board's configuration in the CMOS RAM (reside in 82C206).

The user may attached a 4.5 V external battery pack to J10 when the internal battery is exhausted.

Internal Battery Using   Attached External Battery
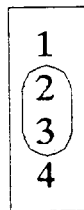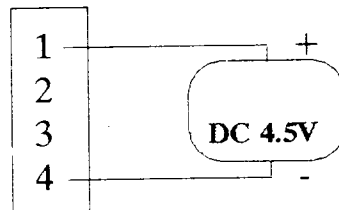
2 . 7 JP4 TURBO LED CONNECTOR

The JP4 connector is where the user connect the cables from the Turbo LED mounted on system case.
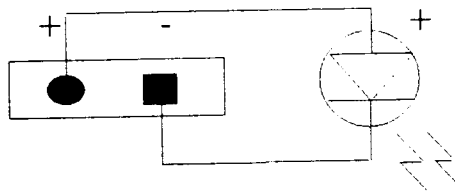
2.8 J23 POWER LED & KEYLOCK CONNECTOR

The J23 connector is where the user connect the power LED and Keylock. The keylock allows the user to ' LOCK ' the keyboard, thus making it disabled for others to access the system.

PIN Assignment

1	Power LED (+)
2	NC
3	GND
4	Keylock
5	GND
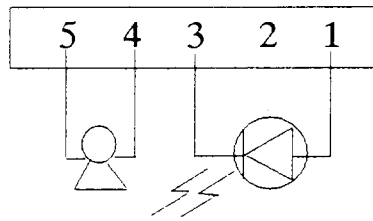
2.9 J24 SPEAKER CONNECTOR

The J24 connector is where the user connect the cables from the speaker mounted on system case.

PIN Assignment

1	Speaker Output
2	NC
3	GND
4	VCC
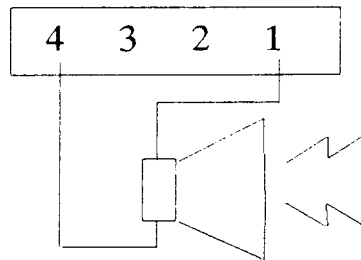
2 . 10 SW2 TURBO SWITCH CONNECTOR

The SW2 connector is where the user connect the cables from the
Turbo Switch mounted on system case.

Open : High Speed

Close : Normal Speed
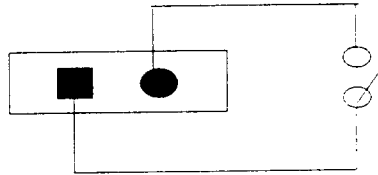
The system speed is also switchable from keyboard :

[Ctrl][Alt][+]   High speed

[Ctrl][Alt][-]   Normal speed

2 . 11 SW1 RESET SWITCH CONNECTOR

The SW1 connector is where the user connect the cables from the
Reset Switch mounted on system case.
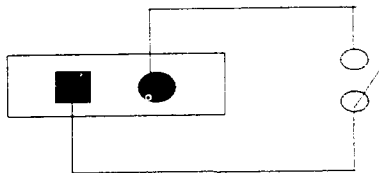
The HOT-307 main board lets the user increase the system's main memory via on-board SIMM (Single In-line Memory Module) sockets. The main board supports two banks of 256KB, 1MB, and 4MB SIMM modules. SIMM of at least 80ns fast page mode DRAM are required.

Main memory is located in two banks : Bank 0 and Bank 1. (Please make a reference of block diagram.) Four SIMM sockets are provided in each bank. The user can install either 256KB, 1MB, or 4MB SIMM in each socket. *The sockets in each bank must be completely filled with the modules of the same type.*

MEMORY CONFIGURATION TABLE			
Option	Bank 0	Bank 1	Total
1	256 K x 4	0	1 M
2	256 K x 4	256 K x 4	2 M
3	1 M x 4	0	4 M
4	256 K x 4	1 M x 4	5 M
5	1 M x 4	1 M x 4	8 M
6	4 M x 4	0	16 M
7	1 M x 4	4 M x 4	20 M
8	4 M x 4	4 M x 4	32 M

When the user first enter the BIOS SETUP PROGRAM,
The BIOS may or may not demand the entrance of password.
If it does, please enter the keyword "*AMI*".

BIOS setup reference was written to assist you in the proper usage of BIOS setting, please take a few minutes to review the references prior to using the program.

After you power on the system, the following message on the screen will be displayed :

" Hit < DEL > if you want to run SETUP"

If you press the < DEL > key , the Setup main menu will be displayed :

```
┌─────────────────────────────────────────────────────────────┐
│  BIOS SETUP PROGRAM - AMI BIOS SETUP UTILITIES              │
│  (C) 1992 American Megatrends Inc., All Rights Reserved     │
├─────────────────────────────────────────────────────────────┤
│                 STANDARD CMOS SETUP                          │
│                 ADVANCED CMOS SETUP                          │
│                 ADVANCED CHIP SETUP                          │
│        BIOS SETUP DEF. AUTO CONFIGURATION OPTION            │
│        POWER-ON DEF. AUTO CONFIGURATION OPTION             │
│                 CHANGE PASSWORD                              │
│                 AUTO DETECT HARD DISK                        │
│                 HARD DISK UTILITY                            │
│                 WRITE TO CMOS AND EXIT                       │
│                 DO NOT WRITE TO CMOS AND EXIT               │
│                                                             │
│  Advanced CHIPSET Setup for Configuring the CHIPSET Registers│
│                                                             │
└─────────────────────────────────────────────────────────────┘
     ESC:Exit  ⇓ ⇒ ⇑ ⇐: Sel F2/F3:Color  F10:Save & Exit
```

Listed below is an explanation of the key displayed at the bottom of the screens accessed through the BIOS setup program :

Key Pad	Usage
ESC	Exit to previous screen.
ARROW KEYS	Move cursor to the desired selection.
PU/PD	Modify the default value of the options for the highlighted feature.
F1	Displays help screen for selected feature.
F2/F3	Changes background and foreground colors.
F5	Retrieves the values which were resident when current setup session was started.
F10	Saves all changes made to Setup and Exit program.

Choose "Standard CMOS Setup" from the Setup main menu and the following screen will be displayed :

```
BIOS SETUP PROGRAM - STANDARD CMOS SETUP
( C ) 1992 American Megatrends Inc .. All Rights Reserved
```

Date (mon/date/year)	: Mon, Nov, 18, 1991		Base memory : 640 KB			
Time (hour/min/sec)	. 05 : 54 : 48		Ext. memory : 3712 KB			

		Cyln	Head	W/Pcom	LZone	Sect	Size
Hard disk C : Type	: 17	977	5	300	977	17	41MB
Hard disk D : Type	: Not Installed						
Floppy drive A :	: 360 KB, 51/4"						
Floppy drive B :	: Not Installed						
Primary display	: Monochrome						
Keyboard	: Installed						

Sun	Mon	Tue	Wed	Thu	Fri	Sat
27	28	29	30	31	1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31	1	2	3	4	5	6

```
Month : Jan, Feb, .........., Dec
Date  : 01, 02, 03, .........., 31
Year  : 1901, 1902, ........, 2009
```

ESC : Exit ⇐ ⇑ ⇒ ⇓ : Select F2/F3 : Color Pu/Pd : Modify

Making Changes :

Through the "Standard CMOS Setup" screen, user can make a check or modification of system configurations -- Date, Time, Hard disk & Floppy disk types, Display and Keyboard.

The Advanced CMOS setup is the second option from the main setup menu.

Let the highlighted bar stay at "Advanced CMOS Setup" and press < ENTER >, the following screen will be displayed :

```
                BIOS SETUP PROGRAM - ADVANCED CMOS SETUP
             ( C ) 1992 American Megatrends Inc ., All Rights Reserved

  Above 1 MB Memory test      : Disabled    Adaptor ROM Shadow DC00, 16K : Disabled
  Memory Test Tick Sound      : Enabled     Adaptor ROM Shadow E000, 16K : Disabled
  Memory Parity Error Check   : Disabled    Adaptor ROM Shadow E400, 16K : Disabled
  Hard Disk Type 47 RAM Area  : 0 : 300     Adaptor ROM Shadow E800, 16K : Disabled
  System Boot Up Num Lock     : On          Adaptor ROM Shadow EC00, 16K : Disabled
  Numeric Processor Test      : Enabled     Shadow RAM Option            : Both
  Weitek Processor            : Disabled
  Floppy Drive Seek At Boot   : Enabled
  System Boot Up Sequence     : A :, C:
  External Cache Memory       : Enabled
  Internal Cahce Memory       : Disabled
  Turbo Switch Function       : Enabled
  Password Checking Option    : Setup
  Adaptor ROM Shadow C800, 16K : Disabled
  Adaptor ROM Shadow CC00, 16K : Disabled
  Adaptor ROM Shaodw D000, 16K : Disabled
  Adaptor ROM Shaodw D400, 16K : Disabled
  Adaptor ROM Shadow D800, 16K : Disabled

  ESC : Exit  ⇐ ⇑ ⇒ ⇓ : Sel  (Crtl) Pu/Pd : Modify  F1 : Help   F2/F3 : Color
  F5 : Old Values  F6 : BIOS Setup Defaults   F7 : Power-On Defaults
```

■ Above 1 MB
Memory Test

If there are more than 1 MB of RAM on system board, by enabling this option, will involve the POST memory routines on the RAM above 1 MB. If disabled, the BIOS only check the first 1 MB of RAM.

■ Memory
Test Tick Sound

This option will enable or disable the ticking sound during RAM test.

■ Memory Parity
Error Check

This option will enable or disable the system memory parity error check. If the system board does not have parity RAM, the user may disable the memory parity error checking routines in the BIOS.

■ Hard Disk Type
47 Data Area

The BIOS setup features two user-definable hard disk types. Normally, the data for these disk types are stored at 0:300 in lower system RAM. If a problem occurs with other software, this data can be located at the upper limit of the DOS shell (640KB). If the option is set to "DOS 1 KB", the DOS shell is shortened to 639 KB, and the top 1 KB is used for the hard disk data storage.

■ System Boot Up
NumLock

When this option is turned on, it may allow the user to use the numeric key on the Enhanced Keyboard numeric keypad when the system is powered on.

■ Numeric
Processor Test

This option allows the user to mark the numeric processor (Intel 80387 or compatible) as present or absent.

■ Weitek
Processor

This option allows the user to indicate the BIOS whether the the system present or absent a Weitek Processor.

■ Floppy Drive
Seek At Boot

This option enable or disable seeking floppy drive A: when system boots-up. Disable it to allow a fast boot and to decrease the possibility of damage to floppy drive heads.

■ System Boot Up
Sequence

If the option is set to "C:, A:", the system will attempt to boot from hard disk drive C:, and then A:. If the option is setted to "A:, C:", the sequence is reversed. (Note: "A:, C:" must match the enabling of floppy drive seek at boot)

■ External Cache
Memory

With this features, the user may specify whether the external cache memory is present or absent.

■ Internal Cache
Memory

This function is available when the Cyrix or TI 486DLC CPU been used, the user may enable the cache memory inside of CPU. When the Intel or AMD 80386DX CPU been used, this function always disabled.

■ Turbo Switch
Function

This feature provides the user may enable or disabled the turbo switch function.

■ Password
Checking
Option

The password checking feature can be used to prevent unauthorized system boot-up or un-authorized use of BIOS SETUP. There are thwo options in this item, " SETUP " and " AL-WAYS ".

■ Adaptor ROM
Shadow xxxx,
16K

ROM shadow is a procedure in which BIOS code is copied from slower ROM to faster RAM. Each option allows for a segment of 16 KB to be shadowed from ROM to RAM, if these option is enabled.

■ Shadow RAM   In this item available options are " Disabled ", "
  Option   Video ", " Main ", " Both ". The same concept
                 applies here as above. If you chose " Both ", then
                 main and video will be shadowed. Setting "
                 Main ", only system BIOS will be shadowed, and
                 " Video " will shadow the video ROM in RAM
                 instead.

This program of the BIOS Setup is entirely chip set specific, and is used to change the values of chip set registers. These registers control most of the system options in the computer. By using arrow keys you make highlighted bar stay at "Advanced Chipset Setup" then press < ENTER >. The following screen will be displayed :

```
         BIOS SETUP PROGRAM - ADVANCED CHIP SETUP
          ( C ) 1992  American  Megatrends Inc ., All  rights  reserved

  Hidden Refresh                : Enabled
  Single ALE Enabled            : No
  Keyboard Reset Control         : Enabled
  Master Mode Byte Swap          : Disabled
  AT Cycle Wait State            : Enabled
  Memory Read Wait State         : 1 W/S
  Memory Write Wait State        : 0 W/S
  Cache Write Wait State         : 0 W/S
  Non-Cacheable Block-1 Size     : Disabled
  Non-Cacheable Block-1 Base     : 0 KB
  Non-Cacheable Block-2 Size     : Disabled
  Non-Cacheable Block-2 Base     : 0 KB
  Cacheable RAM Address Range    : 16 MB
  Video BIOS Area Cacheable      : Yes
  AT Bus Clock                   : CLKIN/10

  ESC : Exit   ⇐ ⇑ ⇒ ⇓ : Sel   (Crtl) Pu/Pd : Modify   F1 : Help   F2/F3 : Color
  F5 : Old Values   F6 : BIOS Setup Deafults   F7 : Power-On Defaults
```

The following table shows the proper setting of "Avcanced Chipset Setup" for different system of clock speed

Feature	386DX -40	386DX -33
Memory Read Wait State	1 W / S	0 W / S
Memory Write Wait State	0 W / S	0 W / S
Cache Write Wait State	0 W / S	0 W / S
AT Bus Clock	CLKIN/10	Jumper

■ Hidden
Refresh

Enabled for hidden refresh and disabled for normal refresh. If it enabled, the AT-bus controller will perform arbitration among the CPU AT cycle, DMA cycle, and refresh cycle.

■ Single
ALE Enable

If enable single ALE (AT-bus Address Latch Enable), it will activate single ALE instead of multiple ALEs during bus conversion cycle.

■ Keyboard Reset
Control

This feature determines whether " HALT " instruction will be executed or not before CPU reset from keyboard reset.

■ Master Mode
Byte Swap

This feature option are disabled and enabled. Defaults is disabled.

■ AT Cycle Wait
State

This feature allows the user enabling or disabling insert one extra wait state in standard AT bus cycle.

■ Memory Read
Wait State

This feature allows the user to select whether zero read wait state or one/two read wait state for memory controlled by the chip set.

■ Memory Write
Wait State

This feature allows the user to select whether zero write wait state or one/two write wait state for memory controlled by the chip set.

■ Cache Write
Wait State

This features allows the user to select whether zero or one write wait state for cache write wait state control.

■ Non-Cacheable
Block - 1/2 Size

This feature allows the user to set the first/second region of memory where memory caching will not take place. This can be used if user have a option card which requires that memory not be cached.

■ Non-Cacheable   This features sets where the first/second region
Block - 1/2 Base   start. This option can only be used if the non-
                   cacheable block-1/2 is enabled.

■ Cacheable   This feature allows the user to set the address
RAM Address   range of on-board DRAM size.
Range

■ Video   BIOS   This feature allows the user to set whether the
Area Cacheable   video BIOS at C0000h ˜ C8000h area are
                   cacheable or non-cacheable.

■ AT Bus Clock   This feature allows the user to select the AT Bus
                   Clock from jumper (JP3) on board or BIOS .
                   The selections are " CLKIN/10 " or " Jumper ".

                   " CLKIN/10 " recommend to 40 MHz. system
                   "   Jumper   " recommend to 33 MHz. system

Hardware failures are generally due to malfunctioned or improper equipment installed.

Review the following symptoms and suggested actions. Most common problems can be solved by following suggestions. If all fail, contact your supplier for assistance.

☐ **No Display**

1. Set the monitor's brightness & contrast control to their mid-range.

2. Check the SW setting on the display card.

3. Make sure the video signal cable is securely connected.

4. Inspect the CPU (PGA), whether it is in the right direction or inserted firmly.

☐ **No Keyboard Response**

1. Make sure the keyboard lock SW is in the unlocked position.

2. There is a switch, on some keyboards, to select its operation mode. Make sure your keyboard is set as AT-compatible.

3. When you first turn on the system, the capslock, numlock LEDs should briefly light up during power-on self-test. If they don't light up, contact your supplier for assistance.

☐ **Lost Configura-** 1. Make sure the Battery is connected
tion/Time After   properly.
Turning Off Power
                       2. Battery may be worn down.

☐ **Parity Error**   1. Possible memory device failure. Run a
                       memory diagnostic or contact your sup-
                       plier for assistance.

☐ **Fixed Disk Doesn't** 1. Make sure all cables are connected
Work   properly and securely.

                       2. Make sure the disk drive is configured
                       from drive 0.

                       3. The drive was not physically formatted,
                       paritioned, or DOS formatted or all
                       three.

☐ **Diskette Drive** 1. Make sure all connectors are correct and
Doesn't Work   secure.

                       2. The drive activity LED should briefly light
                       up during power-on self-test. If it doesn't
                       , check the drive for failures.

☐ **Front Panel LEDs** 1. Make sure all connectors to the main
are not light   board are correctly installed.

                       2. Running a benchmark program such as
                       Norton, SI, Landmark Speed will tell you
                       if the turbo/normal SW is having an effect
                       on system speed. If it has no effect and
                       the LED doesn't change, there may be a
                       failed component in the front panel
                       electronics.

                       3. Contact your supplier for help.

Information Sheet Of User's System Board

To   : _____   Attn : _____
From : _____   CC   : _____
Date : _____   Page : ____ Of : _____

User's Data

Name   : _____ Tel No : _____ FAX No : _____
Address : _____
Contact person : _____

Specification of Main Board

Model No : _____
CPU Type & Brand : _____
On Board Memory : _____ KB
RAM Type : _____ ns ☐ DIP ☐ Module Brand : _____
On Board Cache Memory : ____ KB   SRAM Type : _____

Add On-Card

Video   : Type _____ Model No : _____ Brand : _____
Adapter   : Type _____ Model No : _____ Brand : _____
LAN Card : Type _____ Model No : _____ Brand : _____
Others   : _____

Power Supply

Watts : _____   Brand : _____

Application Software

_____
_____

Description of Problem

_____
_____
_____