

***DTK PAM-0035S
P54C PCI Mainboard
User's Manual***



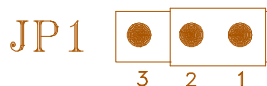
ABOUT THIS GUIDE

This guide contains instructions for configuring and installing the mainboard.

- ! Chapter 1, **Introduction**, acquaints user with the special features of the mainboard.
- ! Chapter 2, **Hardware Configuration**, gives information on configuring memory and setting the mainboard's jumpers. Brief sections on installing memory.
- ! Chapter 3, **Mainboard Installation**, is an overview of how to install the mainboard in a system.
- ! Chapter 4, **BIOS Setup**, provides the BIOS information for system configuration.
- ! Chapter 5, **BIOS POST Messages**, provides references for all POST error messages .
- ! Chapter 6, **BIOS Default Drive Table**, provides a Default Drive Disk table contained in Setup.

WARNING

For the system to operate normally, please make sure JP1 of the mainboard is set as below. Refer to Fig 2 in this manual for the location JP1.



If JP1 is open, no CMOS data can be retained.

The information presented in this publication has been carefully checked for reliability; however, no responsibility is assumed for inaccuracies, whereas, specification is subjected to change without notice.

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UNPACKING THE MAINBOARD

The Mainboard comes packed in a sturdy cardboard shipping carton. The carton contains:

- ! The Mainboard
- ! PCI IDE Driver Diskette
- ! 40-pin Hard Disk Cable
- ! 34-pin Floppy Disk Cable
- ! 25-pin Serial & 15-pin Game Port Cable
- ! 9-pin Serial & 25-pin Parallel Port Cable
- ! This User's Guide

Note: Do not remove the mainboard from its original packing until ready to install.

The mainboard is easily damaged by static electricity. Observe the following precautions while unpacking and installing the mainboard.

1. Touch an unpainted area of the system chassis before handling the mainboard or any component. Doing so, discharges the static charge the user's body may have built.
2. Remove the mainboard from its anti-static wrapping and place it on a grounded surface, component side up.
3. Inspect the mainboard for damage. Shipping may have loosened integrated circuits from their sockets. If any integrated circuit appears loose, press carefully to seat it firmly in this socket.

Do not apply power if the mainboard appears damaged. If there is damage to the board, or items are missing, contact dealer immediately.

CONTENTS

CHAPTER 1	INTRODUCTION	1
1.1	KEY FEATURES	1
1.2	MAINBOARD COMPONENTS	3
1.3	PCI LOCAL BUS SPECIAL FEATURES	4
CHAPTER 2	HARDWARE CONFIGURATION	5
2.1	JUMPER AND MEMORY BANK LOCATIONS	5
2.2	JP01 - CPU TYPE SELECTION	6
2.3	S0-S2, JP0 - CPU CLOCK SELECTION	6
2.4	CPU INSTALLATION	7
2.5	CACHE CONFIGURATION	7
2.5.1	UPGRADING CACHE	8
2.5.2	CACHE SIZE AND MEMORY LOCATIONS	8
2.5.3	CACHE CHIP SOCKETS AND JUMPER LOCATIONS	9
2.5.4	JP7-JP9 - CACHE JUMPER SETTING	9
2.5.5	INSTALLING CACHE CHIPS	10
2.6	JP4 - CACHE INVALIDATION INPUT FOR CPU	10
2.7	JP5 - CPU PIPELINE MODE SELECTION	11
2.8	JP6 - CPU INTERNAL CACHE WRITE BACK/WRITE THROUGH SELECTION	11
2.9	JP12 - VIDEO SELECTION	12
2.10	JP1 - DISCHARGE CMOS RAM	12
2.11	JP2, JP3 - EPROM TYPE SELECTION	13
2.12	JP18 - PARALLEL PORT IRQ SELECTION	13
2.13	JP22, JP23 - PARALLEL PORT SETTING AND ECP DMA SELECTION	14
2.14	MEMORY INSTALLATION	14
2.14.1	INSTALLING SIMM	17

CHAPTER 3	MAINBOARD INSTALLATION	19
3.1	COMPONENTS	19
3.2	INSTALLING THE MAINBOARD	20
3.3	CONNECTION THE MAINBOARD	21
3.3.1	CONNECTION LOCATIONS	21
3.4	CONNECTORS	22
3.4.1	J1 - CPU FAN POWER CONNECTOR	22
3.4.2	J2 - HARD DISK LED CONNECTOR	22
3.4.3	J3 - KEYLOCK & POWER LED CONNECTOR	23
3.4.4	J4 - SPEAKER CONNECTOR	23
3.4.5	J5 - TURBO SWITCH CONNECTOR	24
3.4.6	J6 - TURBO LED CONNECTOR	24
3.4.7	J7 - HARDWARE RESET CONNECTOR	25
3.4.8	J8 - ON BOARD PCI IDE 1 HDD CONNECTOR	25
3.4.9	J9 - ON BOARD PCI IDE 0 HDD CONNECTOR	25
3.4.10	J10 - KEYBOARD CONNECTOR	26
3.4.11	J11 - POWER SUPPLY CONNECTOR	26
3.4.12	J12 - ON BOARD COM1 CONNECTOR	27
3.4.13	J13 - ON BOARD COM2 CONNECTOR	27
3.4.14	J14 - ON BOARD GAME PORT CONNECTOR	27
3.4.15	J15 - ON BOARD PARALLEL PORT CONNECTOR	27
3.4.16	J16 - ON BOARD FDD CONNECTOR	27
3.4.17	JP11 - GREEN PC BREAK SWITCH	27
3.5	HARDDISK INSTALLATION	28
3.6	HARDWARE/SOFTWARE INSTALLATION	28
3.7	SYSTEM ASSEMBLY OVERVIEW	29

CHAPTER 4	AWARD BIOS SETUP	31
4.1	ENTERING SETUP	31
4.2	CONTROL KEYS	32
4.3	GETTING HELP	32
4.4	THE MAIN MENU	33
4.4.1	STANDARD CMOS SETUP MENU	34
4.4.2	BIOS FEATURES SETUP MENU	35
4.4.3	CHIPSET FEATURES SETUP MENU	36
4.4.4	POWER MANAGEMENT SETUP MENU	37
4.4.5	PCI CONFIGURATION SETUP MENU	38
4.4.6	LOAD BIOS DEFAULTS MENU	39
4.4.7	LOAD SETUP DEFAULTS MENU	39
4.4.8	PASSWORD SETTING MENU	39
4.4.9	IDE HDD AUTO DETECTION MENU	40
4.4.10	HDD LOW LEVEL FORMAT MENU	41
4.4.11	SAVE & EXIT SETUP MENU	44
4.4.12	EXIT WITHOUT SAVING MENU	44
CHAPTER 5	BIOS POST MESSAGE	45
5.1	POST BEEP	45
5.2	ERROR MESSAGES	45
CHAPTER 6	BIOS DEFAULT DRIVE TABLE	51

CHAPTER 1 INTRODUCTION

The mainboard is a 2/3 bady AT size high-performance mainboard that provides with basic elements on which to build an advanced computer. The mainboard running at 75MHz, 90MHz, 100MHz, 120MHz or up to 133MHz, supporting the Intel Pentium CPU.

1.1 KEY FEATURES

The advanced features of the mainboard include:

- ! Intel Pentium CPU, Cyrix M1 support up to 75, 90, 100, 120 or 133MHz CPU speed.
- ! Support SIS 85C50X or 85C550X chipset and Winbond W83769F, W83787F, W83768F chip.
- ! 100% IBM PC-AT Hardware and Software compatible.
- ! Provides power saving features:
 - Supports Pentium SMM and SMI
 - Long and short System Timer
 - Supports Break Switch Control
 - Cut power of CPU Cooling Fan
- ! Direct Mapped Cache Controller
 - Write-Back or Write-Through Schemes
 - Flexible Cache Size: 256/512/1024KB
- ! Memory size from 2MB to 128MB, possible using combinations of 1/2/4/8/16/32/64MB 72-pin SIMM modules in four SIMM sockets. Support "Table-Free" DRAM Configuration.
- ! FP (Fast Page) DRAM or EDO (Extended Data Output) DRAM support.
- ! Provide 2 enhanced PCI IDE channels which support up to 4 IDE devices.

- ! Easy upgrade CPU speed by alter jumpers only.
- ! System & video Bios Shadow, optional caching of shadowed system & video BIOS.
- ! Provide FDD channels which support 360K, 720K, 1.2M & 1.44M Floppy Disks, two 16550 compatible UARTs, one parallel port with EPP/ECP mode, and one joystick port.
- ! Hidden DRAM refresh support.
- ! Support 7 Direct Memory Access channels and 16 Interrupt levels.
- ! Four 16-bit I/O slots, and 4 PCI slots (4 Masters).
- ! Flash ROM supports
- ! Battery backup for CMOS configuration and real time clock/calender.
- ! 8MHz AT Bus clock & speed changeable by hardware or keyboard.
- ! User Defined Password to inhibit illegal access.
- ! Baby AT board size = 220mm(W) X 270mm(L).
- ! Performance: (CPU clock = 90MHz / 100MHz)
 - **Landmark CPU Speed Test V2.0**
 - CPU: 519.45MHz / 576.95MHz
 - FPU: 1740.43MHz / 1950.34Hz
- **Power Meter V1.7**
- 61.9MIPS / 68.4MIPS

1.2 MAINBOARD COMPONENTS

This section gives a brief description of key components on the mainboard. Refer to Fig 1 for component locations.

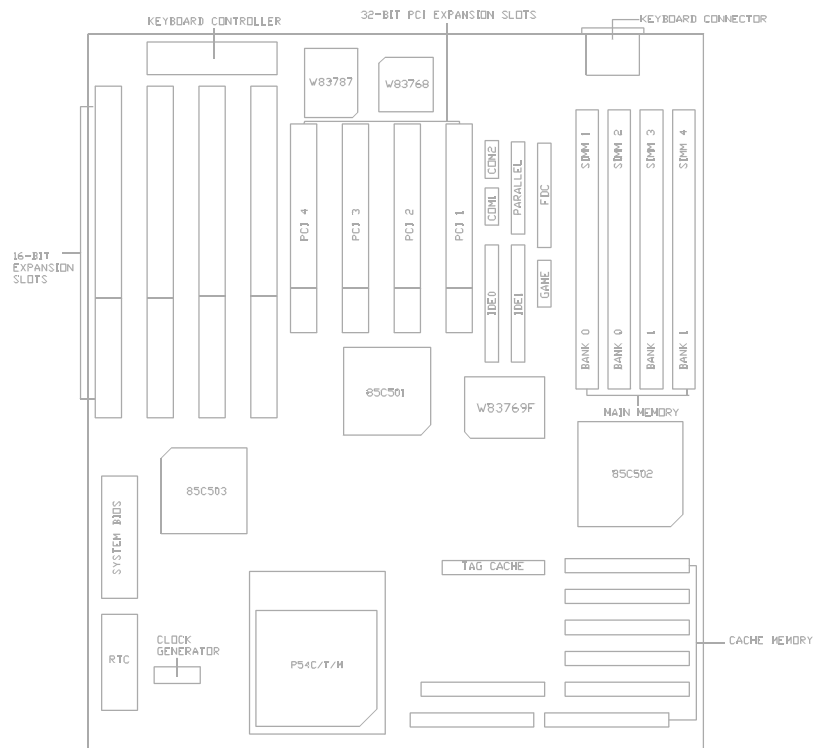


Fig 1 Key Components of the Mainboard

1.3 PCI LOCAL BUS SPECIAL FEATURES

- ! PCI (Peripheral Component Interconnect) Local-Bus is the latest Local Bus Standard which adapts the high performance and supports the future standard on the PC industry.
- ! Four PCI slots are provided on the mainboard support up to four Bus Master devices.
- ! PCI BIOS supports the PCI device configuration, and fully compatible with existing drivers and application software.
- ! Synchronous Bus operates in 32-bit with up to 33MHz.

CHAPTER 2 **HARDWARE**

CONFIGURATION

This chapter describes how to set the mainboard jumpers for cache memory and display type, and how to install memory modules.

Before beginning the configuration, user should take the following precautions:

- ! Turn off the power supply, and unplug the power cord before begin.
- ! Unplug all cables that connect the mainboard to any external devices.

2.1 **JUMPER AND MEMORY BANK LOCATIONS**

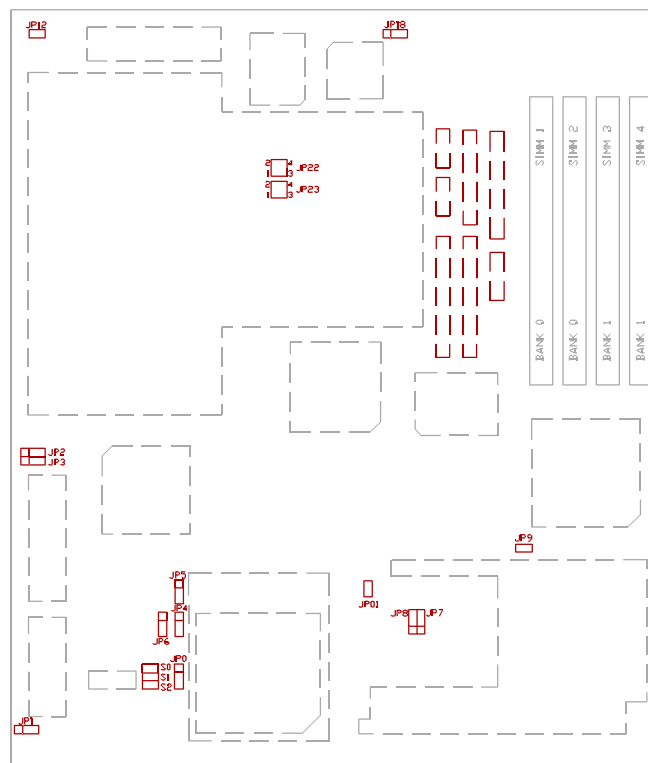


Fig 2 Jumper and Memory Bank Locations

2.2 JP01 - CPU TYPE SELECTION

The mainboard can support processor at different speed. Various jumper are required to setup for installing different CPU. Refer to Fig 2 for jumper location, and set the jumper according to the following table:

JP01 -- CPU Type Selection



CPU Type Selection	JP01
P54C, P54CS P54C-VR, M1	 CLOSE
P54C-VRE, P54CT	 OPEN

Table 1: CPU Type Configuration

2.3 S0-S2, JP0 - CPU CLOCK SELECTION

S0, S1, S2 and JP0 are for setting the CPU clock speed. Refer to Fig 2 for the jumpers location, and set the jumper according to the following table:

S0, S1, S2, JP0 -- CPU Clock Selection


CPU Clock Selection	S2	S1	S0	JP0
75MHz	 CLOSE	 OPEN	 OPEN	 3 2 1
90MHz (DEFAULT)	 OPEN	 CLOSE	 OPEN	 3 2 1
100MHz	 CLOSE	 OPEN	 CLOSE	 3 2 1
120MHz	 OPEN	 CLOSE	 OPEN	 3 2 1
133MHz	 CLOSE	 OPEN	 CLOSE	 3 2 1

Table 2: CPU Clock Selection

2.4 CPU INSTALLATION

The mainboard has a socket that can support Pentium CPU. See Fig 1 in Chapter 1 for the socket's location.

Install the CPU as follows:

Caution: Static electricity can damage the processor.

Plug the CPU into the socket, with the notch corner aligned.

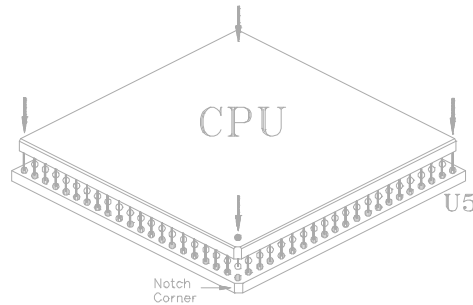


Fig 3 Installing a CPU

2 . 5 C A C H E C O N F I G U R A T I O N

The special feature of the mainboard is a built-in direct-mapped cache controller with optional write-back or write-through operation which supports 256KB, 512KB, or 1MB cache memory.

The mainboard has a built-in cache controller. It requires external SRAM as tag and cache memory. The caching Scheme is direct mapping with selectable write-back or write-through operation. The mainboard allows 256KB, 512KB, or 1MB cache configurations. Memory size is selected by the hardware jumpers and the BIOS setup program.

2.5.1 UPGRADING CACHE

The mainboard is available with an optional 256KB, 512KB, or 1MB cache memory on-board. User can upgrade cache memory by installing additional SRAM (Static Random Access Memory) chips in sockets U10-U17; U9.

The speed of the SRAM chips needed depends on the clock speed of the microprocessor:

75,90,100,120,133MHz CPU requires **15ns (tag and data)** SRAM chips.

2.5.2 CACHE SIZE AND MEMORY LOCATIONS

The table on following page describes the chip capacity and socket location required for each cache size configuration. User can use 32Kx8-bit, 64Kx8-bit, or 128Kx8-bit SRAM chips in the Data RAM sockets, and 8Kx8-bit, 16Kx8-bit or 32Kx8-bit SRAM chips in the Tag RAM socket.

	DATA RAM	TAG RAM
Cache Size	U10 - U17	U9
256K	32Kx8	8Kx8/16Kx8
512K	64Kx8	16Kx8/32Kx8
1M	128Kx8	32Kx8

Table 3: Cache Size Configuration

2.5.3 CACHE CHIP SOCKETS AND JUMPER LOCATIONS

The diagram below describes the location of the cache chip sockets and cache jumpers.

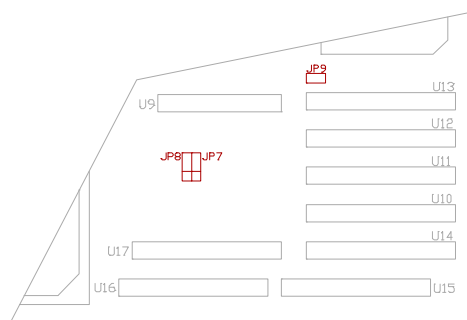


Fig 4 Cache Jumper and Socket Locations

2.5.4 JP7-JP9 - CACHE JUMPER SETTING

Cache memory is configured using jumpers, JP7, JP8, & JP9. The following table summarize the possible configuration.

JP7, JP8, JP9 -- Cache Jumper Setting

Cache Size	JP7	JP8	JP9
256KB (DEFAULT)			
512KB			
1MB			

Table 4: Cache Jumper Setting

2.5.5 INSTALLING CACHE CHIPS

Install cache chips on the mainboard as follows:

Caution: Static electricity can damage a cache chip.

1. Review the section on static electricity precautions at the beginning of this manual, and make sure that power to the mainboard is off.
2. Align the chip so that the notched corner of the chip matches the notched corner of the socket.
3. Align the pins with the socket holes.
4. Carefully press the chip into the socket.

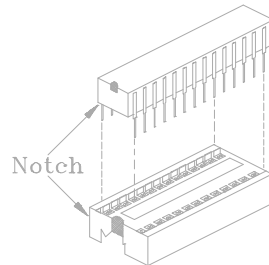


Fig 5 Installing a Cache Chip

2.6 JP4 - CACHE INVALIDATION INPUT FOR CPU

JP4 is the Cache Invalidation Input for CPU, which determines the final cache line state in case of an inquiry cycle hit. Refer to Fig 2 for the location, and set the jumper according to the following table:

JP4 -- Cache Invalidation Input for CPU

CACHE INVALIDATION INPUT FOR CPU	JP4
ONLY INVALID IN WRITE CYCLE (DEFAULT)	
ALWAYS INVALID	

Table 5

2.7 JP5 - CPU PIPELINE MODE SELECTION

JP5 is used to enable or disable the pipeline mode of CPU. Refer to Fig 2 for the location, and set the jumper as below.

JP5 -- CPU Pipeline Mode Selection

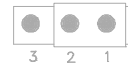
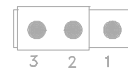
CPU PIPELINE MODE SELECTION	JP5
DISABLED (DEFAULT)	
ENABLED	

Table 6

2.8 JP6 - CPU INTERNAL CACHE WRITE BACK/ WRITE THROUGH SELECTION

JP6 is used to select the CPU Internal Cache to be Write Back or Write Through. Refer to Fig 2 for the location.

JP6 -- CPU Internal Cache Write Back/Through Selection



CPU INTERNAL CACHE WRITE BACK/THROUGH SELECTION	JP6
WRITE BACK (DEFAULT)	
WRITE THROUGH	

Table 7

2.9 JP12 - VIDEO SELECTION

Please set JP12 for Mono or Color Video Display. Refer to Fig 2 for the location.

JP12 -- Video Selection



Video Selection	JP12
Color (Default)	 CLOSE
Monochrome	 OPEN

Table 8

2.10 JP1 - DISCHARGE CMOS RAM

JP1 is used to clear the content of the CMOS RAM in the RTC chip DS12887A. Refer to Fig 2 for the location.

JP1 -- Discharge CMOS RAM

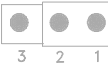
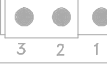






DISCHARGE CMOS RAM	JP1
NORMAL OPERATION (DEFAULT)	 3 2 1
DISCHARGE	 3 2 1

Table 9

2.11 JP2, JP3 - EPROM TYPE SELECTION

JP2, JP3 are for EPROM Type Selection. Refer to Fig 2 for the location.

JP2, JP3 -- EPROM Type Selection

EPROM TYPE SELECTION	JP2	JP3
EPROM IN USE (DEFAULT)		
12V FLASH EPROM IN USE		
5V FLASH EPROM IN USE		

12V FLASH EPROM: MX 28F1000, ST 28F101, etc
 5V FLASH EPROM: SST 29EE010, etc

Table 10

2.12 JP18 - PARALLEL PORT IRQ SELECTION

JP18 is for Parallel Port IRQ selection. Refer to Fig 2 for the location.

JP18 -- Parallel Port IRQ Selection

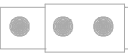

PARALLEL PORT IRQ SELECTION	JP18
IRQ7 (DEFAULT)	
IRQ5	

Table 11

2.13 JP22, JP23 - PARALLEL PORT SETTING AND ECP DMA SELECTION

JP22, JP23 are for Parallel Port Setting and ECP DMA selection. Refer to Fig 2 for the location.

JP22, JP23 -- Parallel Port Setting

PARALLEL PORT DMA SETTING	JP22	JP23
PRINTER (DEFAULT)		
DMA 1 Select for ECP		
DMA 3 Select for ECP		

Table 12

2.14 MEMORY INSTALLATION

The mainboard lets user add system memory via SIMM sockets on the mainboard. On-board memory is located in two banks: Bank 0 - SIM1 & SIM2, and Bank 1 - SIM3 & SIM4. DRAM Configuration "Table-Free" is supported on this board. See Fig 2.

User can install either 1/2/4/8/16/32/64MB SIMM (72-pin) in each SIMM socket. Note that all SIMM modules in a bank must be the same capacity. SIMM speed required for best performance depends on the CPU speed, which requires 70ns SIMM.

The mainboard supports the following configurations:

SIM 1	SIM 2	SIM 3	SIM 4	Memory Size
1M	1M	NONE	NONE	2MB
2M	2M	NONE	NONE	4MB
1M	1M	1M	1M	4MB
2M	2M	1M	1M	6MB
4M	4M	NONE	NONE	8MB
2M	2M	2M	2M	8MB
1M	1M	4M	4M	10MB
2M	2M	4M	4M	12MB
8M	8M	NONE	NONE	16MB
4M	4M	4M	4M	16MB
8M	8M	1M	1M	18MB
2M	2M	8M	8M	20MB
8M	8M	4M	4M	24MB
16M	16M	NONE	NONE	32MB
8M	8M	8M	8M	32MB
TO BE CONTINUE...				

Table 13A: On-board Memory Configuration

SIM 1	SIM 2	SIM 3	SIM 4	Memory Size
1M	1M	16M	16M	34MB
2M	2M	16M	16M	36MB
4M	4M	16M	16M	40MB
8M	8M	16M	16M	48MB
32M	32M	NONE	NONE	64MB
16M	16M	16M	16M	64MB
32M	32M	1M	1M	66MB
2M	2M	32M	32M	68MB
32M	32M	4M	4M	72MB
8M	8M	32M	32M	80MB
16M	16M	32M	32M	96MB
32M	32M	32M	32M	128MB

Table 13B: On-board Memory Configuration

2.14.1 INSTALLING SIMM

Install a SIMM in a memory socket as follows:

Caution: Static electricity can seriously damage SIMM modules.

1. Review the section on static electricity precautions at the beginning of this manual.
2. Align the SIMM module so that the pin-1 marking on the module corresponds to the socket pin-1 marking.
3. Hold the module at a 70-degree angle to the socket, and insert the module's connectors into the socket.
4. Snap the module to a vertical position in the socket. The module is fully inserted when retaining pegs snap into holes at each end of the module.

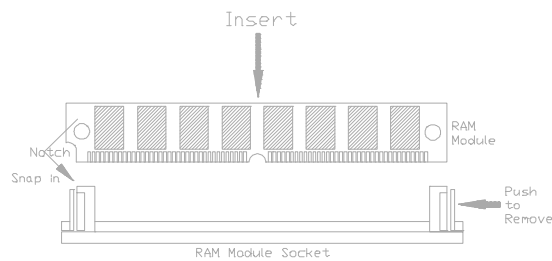


Fig 6 Installing a SIMM

5. To fill a bank, repeat steps 1 through 4 until the sockets in each bank contain SIMMs.
6. After installing memory, run BIOS Setup to indicate to the system for how much memory the user has installed.

3.2 INSTALLING THE MAINBOARD

Before starting, check the location of the mounting holes in the case and on the mainboard.

Caution: *Static electricity can damage the mainboard.*

Install the mainboard as follows:

1. Review the section on static electricity precautions at the beginning of this manual.
2. Place the case on an anti-static mat and remove the cover. Remove the nylon stand-offs and screws for mounting the mainboard.
3. Put the front of the case to the right and the rear to the left. The mainboard occupies the section of the case nearest the user; the power supply goes on the far side.
4. Align the mounting holes on the case to the mounting holes on the mainboard. Make sure to access the keyboard connector once the board is installed.
5. From the bottom of the mainboard, insert stand-offs into the proper holes on the board, and attach the mounting screws to the bottom of the case.

Note: *Some cases do not use stand-offs and mounting screws; in this case user can fasten the mainboard into the case with regular screws.*

6. Place the mainboard into the case and fasten the board securely with regular screws.

3.3 CONNECTION THE MAINBOARD

Once the mainboard has been fastened into the system case, the next step is to connect the internal cables. The internal cables are wire leads with plastic female connectors that attach to the connectors. A description of each connector and its connector pins follows. See Fig 7 for the location of the connectors on the mainboard.

Note: Before making connectors on the board, make sure that power to the system is turned off.

3.3.1 CONNECTION LOCATIONS

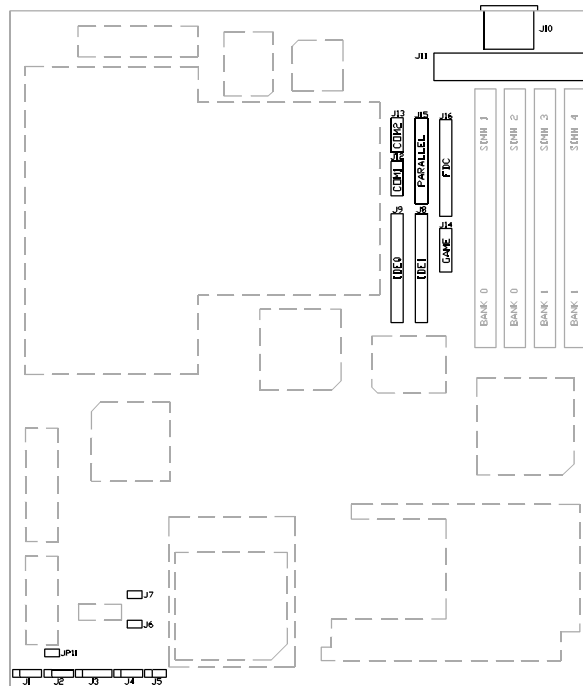


Fig 7 Connectors Layout

3.4 CONNECTORS

3.4.1 J1 - CPU FAN POWER CONNECTOR

J1 connects to the cooling fan of the CPU.

Pin	Description
1	+12V
2	Ground
3	Ground
4	+5V

Table 14

3.4.2 J2 - HARD DISK LED CONNECTOR

J2 connects to the HDD LED in front of the system case.

Pin	Description
1	+ Anode
2	- Cathode
3	- Cathode
4	+ Anode

Table 15

3.4.3 J3 - KEYLOCK & POWER LED CONNECTOR

J3 is a keylock connector that enables and disables the keyboard and the Power-LED on the case.

Pin	Description
1	LED Power
2	Not Used
3	Ground
4	Keyboard Inhibit
5	Ground

Table 16

3.4.4 J4 - SPEAKER CONNECTOR

Attached the system speaker to connector J4.

Pin	Description
1	Data Out
2	+5V
3	Data Out
4	+5V

Table 17

3.4.5 J5 - TURBO SWITCH CONNECTOR

J5 connects to the Turbo switch, which is used to select the mainboard's clock speed.

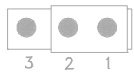
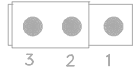
TURBO SWITCH	J5
TURBO (DEFAULT)	
DE-TURBO	

Table 18

3.4.6 J6 - TURBO LED CONNECTOR

J6 is usually connected to a Turbo LED on front of the system case.

Pin	Description
1	- Cathode
2	+ Anode

Table 19

3.4.7 J7 - HARDWARE RESET CONNECTOR

Attach the Hardware Reset Switch cable to this connector. The Hardware Reset restarts the system.



HARDWARE RESET	J7
NORMAL	 OPEN
RESET	 CLOSE

Table 20

3.4.8 J8 - ON BOARD PCI IDE 1 HDD CONNECTOR

J8 is a 40-pin IDE Hard Disk connector. It is assigned as Channel 1 for Secondary Hard Disk Controller connector.

3.4.9 J9 - ON BOARD PCI IDE 0 HDD CONNECTOR

J9 is a 40-pin IDE Hard Disk connector. It is assigned as Channel 0 for Primary Hard Disk Controller connector.

3.4.10 J10 - KEYBOARD CONNECTOR

A standard five-pin female DIM keyboard connector is located at the rear of the keyboard. Plug the jack on the keyboard cable into this connector.

Pin	Description
1	Keyboard Clock
2	Keyboard Data
3	Spare
4	Ground
5	+5V DC

Table 21

3.4.11 J11 - POWER SUPPLY CONNECTOR

The power supply connector has twelve-pin male header connectors. Plug the dual connectors from the power directly onto the board connector.

J11			
Pin	Description	Pin	Description
1	Power Good	7	Ground
2	+5V DC	8	Ground
3	+12V DC	9	-5V DC
4	-12V DC	10	+5V DC
5	Ground	11	+5V DC
6	Ground	12	+5V DC

Table 22

3.4.12 J12 - ON BOARD COM1 CONNECTOR

J12 is a 10-pin COM1 connector. It is assigned as COM1/COM3 for serial port. Refer to Fig 3 for its location.

3.4.13 J13 - ON BOARD COM2 CONNECTOR

J13 is a 10-pin COM2 connector. It is assigned as COM2/COM4 for serial port. Refer to Fig 3 for its location.

3.4.14 J14 - ON BOARD GAME PORT CONNECTOR

J14 is a 16-pin Game Port connector. Refer to Fig 3 for its location.

3.4.15 J15 - ON BOARD PARALLEL PORT CONNECTOR

J15 is a 26-pin Parallel connector. Refer to Fig 3 for its location.

3.4.16 J16 - ON BOARD FDD CONNECTOR

J16 is a 34-pin Floppy Disk connector. Refer to Fig 3 for its location.

3.4.17 JP11 - GREEN PC BREAK SWITCH

JP11 is for Green PC Break Switch setting. Refer to Fig 3 for its location. When the break switch is pressed, it caused an suspend immediately or leave power saving state.

3.5 HARDDISK INSTALLATION

The mainboard on-board built-in the PCI IDE Controller which supports 2 enhanced IDE channels with Primary IDE address on 1F0-1F7, 3F6, 3F7; and Secondary IDE address on 170-177, 376, 377. Please following the steps shown below to process installation.

(1) **2 Drives System:**

Case A: Set Drive C: to Master; and Drive D: to slave and connect both drives on IDE 0 connector. Set Drives C: and D: disk parameters in CMOS.

Case B: Set Drive C: to Master and connect it on IDE 0 connector; and Drive D: to Master and connect it on IDE 1 connector. Set Drives C: and D: disk parameters in CMOS.

(2) **4 Drives System:**

Set Drive C: to Master; and Drive D: to slave, and connect both drives on IDE 0 connector. Set Drive E: to Master; and Drive F: to slave and connect both drives on IDE 1 connector. Set Drives C:, D:, E: and F: disk parameters in CMOS.

3.6 HARDWARE/SOFTWARE INSTALLATION

- (1) **Set Onboard PCI/IDE Chip to "Enable" in BIOS Setup** (refer to Section 4.4.5), then properly connect the IDE cable to IDE drive connector, and to IDE disk drive(s). The cable should have colored band to indicate the Pin 1 position. Make sure the IDE drive cable and the on-board IDE connector are all aligned with Pin 1 position.

- (2) **Perform system CMOS setup, enter correct drive geometry information.** For 4 HDDs system, there is no need to setup the drive geometry information for Drives E: and F:.
- (3) **Install the Device Driver**
Please refer to the **README** file in Driver Diskette for detail installation procedures to be used in various kind of operating system (DOS, Windows 3.1, Windows NT, OS/2 2.XX, Novel 3.1X/4.0X).

3.7 SYSTEM ASSEMBLY OVERVIEW

After installing and connecting the mainboard, assemble components in the following order:

1. **Power Supply:** Place the power supply so that it fits the raised tongues on the chassis floor. Insert and fasten the two screws on the back panel of the chassis. Connect the power supply to the power supply connector.
2. **Disk Drives:** Slide disk drives into the chassis. Connect a wide 34-wire ribbon cable to each disk drive; this cable will attach to an adapter card. The power supply has four cables, each with four wires. Connect these cables to the disk drives.
3. **Adapter Cards:** Insert each adapter card -- Disk Controller cards, Video card, Serial/Parallel Interface card, etc. -- into an expansion slot. Refer to the installation and configuration instructions that comes with the card. Connect the disk drives to the Floppy Disk and Hard Disk Controller cards.
4. **Keyboard:** Connect the keyboard to its connector.

5. **Display:** Connect the display cable to the Video Card, and the display's power cord into a power outlet.
6. **Case:** Slide on the case cover and fasten its screws.

Connect the power cord to the power supply and plug it into a wall outlet. Put the boot disk into drive A: and turn on the power. User will then need to run the BIOS setup program.

CHAPTER 4 AWARD BIOS SETUP

Award's BIOS ROM has a built-in Setup program that allows users to modify the basic system configuration. This type of information is stored in battery-backed RAM so that it retains the Setup information when the power is turned off.

4.1 ENTERING SETUP

Power on the computer and press immediately will allow you to enter Setup. The other way to enter Setup is to power on the computer, when the below message appears briefly at the bottom of the screen during the POST (Power On Self Test), press key or simultaneously press <Ctrl>, <Alt>, and <Esc> keys.

TO ENTER SETUP BEFORE BOOT PRESS CTRL-ALT-ESC OR DEL KEY

If the message disappears before you respond and you still wish to enter Setup, restart the system to try again by turning it OFF then ON or pressing the "RESET" button on the system case. You may also restart by simultaneously press <Ctrl>, <Alt>, and <Delete> keys. If you do not press the keys at the correct time and the system does not boot, an error message will be displayed and you will again be asked to,

PRESS F1 TO CONTINUE, CTRL-ALT-ESC OR DEL TO ENTER SETUP

4.2 CONTROL KEYS

- Up arrow:** Move to previous item
Down arrow: Move to next item
Left arrow: Move to the item in the left hand
Right arrow: Move to the item in the right hand
Esc key: Main Menu -- Quit and not save changes into CMOS
Status Page Setup Menu and Option Page Setup Menu -- Exit
current page and return to Main Menu
PgUp key: Increase the numeric value or make changes
PgDn key: Decrease the numeric value or make changes
F1 key: General help, only for Status Page Setup Menu and Option Page Setup
Menu
F2 key: Change color from total 16 colors
F3 key: Calendar, only for Status Page Setup Menu
F4 key: Reserved
F5 key: Restore the previous CMOS value from CMOS, only for Option Page
Setup Menu
F6 key: Load the default CMOS value from BIOS default table, only for Option
Page Setup Menu
F7 key: Load the default
F8 key: Reserved
F9 key: Reserved
F10 key: Save all the CMOS changes, only for Main Menu

4.3 GETTING HELP

Main Menu:

The on-line description of the highlighted setup function is displayed at the bottom of the screen.

Status Page Setup Menu/Option Page Setup Menu:

Press F1 to pop up a small help window that describes the appropriate keys to use and the possible selections for the highlighted item. To exit the Help window press <Esc>.

4.4 THE MAIN MENU

Once you enter Award BIOS CMOS Setup Utility, the Main Menu will appear on the screen. The Main Menu allows you to select from ten setup functions and two exit choices. Use arrow keys to select among the items and press <Enter> to accept or enter the sub-menu.

ROM PCI/ISA BIOS (2A5IAG32)
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 & ONBOARD I/O SETUP	EXIT WITHOUT SAVING
LOAD BIOS DEFAULTS	
LOAD SETUP DEFAULTS	
Esc : Quit	8 9 6 7 : Select Item
F10 : Save & Exit Setup	(Shift)F2 : Change Color
{Description}	

Fig 8

4.4.1 STANDARD CMOS SETUP MENU

The items on Standard CMOS Setup Menu are divided into 10 categories. Each category includes no, one or more than one setup items. Use the arrow keys to highlight the item and then use the <PgUp> or <PgDn> keys to select the value you want in each item.

ROM PCI/ISA BIOS (2A5IAG32)
STANDARD CMOS UTILITY
AWARD SOFTWARE, INC.

Date (mm:dd:yy) : Fri, Jan 6 1995	
Time (hh:mm:ss) : 15 : 17 : 49	
HARD DISKS	TYPE SIZE CYLS HEAD PRECOMP LANDZ SECTOR MODE
Primary Master : Auto	0 0 0 0 0 0 NORMAL
Primary Slave : None	0 0 0 0 0 0 NORMAL
Secondary Master : None	0 0 0 0 0 0 NORMAL
Secondary Slave : None	0 0 0 0 0 0 NORMAL
Drive A : 1.44M , 3.5in.	Base Memory: 640K Extended Memory: 3072K Other Memory: 384K <hr style="width: 100%;"/> Total Memory: 4096K
Drive B : None	
Video : EGA/VGA	
Halt On : All Errors	
Esc : Quit	8 9 6 7 : Select Item
F1 : Help	(Shift)F2 : Change Color
	PU/PD/+/- : Modify

Fig 9

4.4.2 BIOS FEATURES SETUP MENU

ROM PCI/ISA BIOS (2A5IAG32)
 BIOS FEATURES SETUP
 AWARD SOFTWARE, INC.

Virus Warning	: Disabled	Video BIOS Shadow	: Enabled
CPU Internal Cache	: Enabled	C8000-CBFFF Shadow:	Disabled
External Cache	: Enabled	CC000-CFFFF Shadow:	Disabled
Quick Power On Self Test	: 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:	Disabled
Boot Up Numlock Status	: On		
Boot Up System Speed	: High		
IDE HDD Block Mode	: Disabled		
Gate A20 Option	: Fast		
Typematic Rate Setting	: Disabled		
Typematic Rate (Chars/Sec)	: 6		
Typematic Delay (Msec)	: 250		
Security Option	: Setup		
IDE Second Channel Control	: Enabled		
		ESC: Quit	896 7: Select Item
		F1: Help	PU/PD/+/-: Modify
		F5: Old Values (Shift)	F2: Color
		F6: Load BIOS Defaults	
		F7: Load Setup Defaults	

Fig 10

4.4.3 CHIPSET FEATURES SETUP MENU

ROM PCI/ISA BIOS (2A5IAG32)
 CHIPSET FEATURES SETUP
 AWARD SOFTWARE, INC.

Auto Configuration : Enabled	PCI Clock Frequency : CPUCLK/1.5
L1 Cache Update Mode : WB	CPU/PCI Burst Mem. Write: Disabled
L2 Cache Update Mode : WB	CPU/PCI Post Mem. Write: Disabled
SRAM Speed Option : Faster	ISA Bus Clock Frequency : PCICLK/3
Memory Hole At 15M-16M : Disabled	ISA Bus Refresh Cycle : Enabled
Gate A20 Emulation : Enabled	EDO BRDY# Timing : FP DRAM
Fast Reset Emulation : Enabled	EDO MDLE Timing : FP DRAM
Slow Refresh (1:4) : Disabled	EDO CAS Pulse Width : 2T
Video BIOS Cacheable : Enabled	
	ESC: Quit 896 7: Select Item
	F1: Help PU/PD/+/-: Modify
	F5: Old Values (Shift)F2: Color
	F6: Load BIOS Defaults
	F7: Load Setup Defaults

Fig 11

4.4.4 POWER MANAGEMENT SETUP MENU

ROM PCI/ISA BIOS (2A5IAG32)
POWER MANAGEMENT SETUP
AWARD SOFTWARE, INC.

Power Management : Max Saving	VGA Activity : Disable
PM Control by APM : Yes	IRQ3 (COM 2) : Enable
Video Off Option : Suspend->Off	IRQ4 (COM 1) : Enable
Video Off Method : V/H SYNC+Blank	IRQ5 (LPT 2) : Enable
Suspend Switch : Enable	IRQ6 (Floppy Disk) : Enable
	IRQ7 (LPT 1) : Enable
** PM Timers **	IRQ8 (RTC Alarm) : Disable
HDD Power Down : 5 Min	IRQ9 (IRQ2 Redir) : Enable
Suspend Mode : 20 Sec	IRQ10 (Reserved) : Enable
	IRQ11 (Reserved) : Enable
** PM Events **	IRQ12 (PS/2 Mouse) : Enable
COM Ports Activity : Enable	IRQ13 (Coprocessor) : Enable
LPT Ports Activity : Enable	IRQ14 (Hard Disk) : Enable
HDD Ports Activity : Enable	IRQ15 (Reserved) : Enable
PCI/ISA Master Act. : Disable	
IRQ1-15 Activity : Enable	
	ESC: Quit 896 7: Select Item
	F1: Help PU/PD/+/-: Modify
	F5: Old Values (Shift)F2: Color
	F6: Load BIOS Defaults
	F7: Load Setup Defaults

Fig 12

4.4.5 PCI CONFIGURATION SETUP MENU

ROM PCI/ISA BIOS (2A5IAG32)
 BIOS FEATURES SETUP
 AWARD SOFTWARE, INC.

Slot 1 Using INT# : Auto	Onboard PCI/IDE Chip : Enabled
Slot 2 Using INT# : Auto	Onboard FDD Controller : Enabled
Slot 3 Using INT# : Auto	Onboard Serial Port 1 : COM1
Slot 4 Using INT# : Auto	Onboard Serial Port 2 : COM2
1st Available IRQ : 10	Onboard Parallel Port : 378H
2nd Available IRQ : 11	Onboard Parallel Mode : EPP/SPP
3rd Available IRQ : 9	Onboard Game Port : Enabled
4th Available IRQ : 12	
PCI IRQ Activated By : Level	
PCI IDE IRQ Map To : PCI-AUTO	
Primary IDE INT# : A	ESC: Quit 896 7: Select Item
Secondary IDE INT# : B	F1: Help PU/PD/+/-: Modify
	F5: Old Values (Shift)F2: Color
	F6: Load BIOS Defaults
	F7: Load Setup Defaults

Fig 13

4.4.6 LOAD BIOS DEFAULTS MENU

When you select this function, the following message will appear at the centre of the screen to assist you to load BIOS defaults (except Standard CMOS Setup).

Load BIOS Defaults (Y/N)?

4.4.7 LOAD SETUP DEFAULTS MENU

When you select this function, the following message will appear at the centre of the screen to assist you to load Setup defaults (except Standard CMOS Setup).

Load SETUP Defaults (Y/N)?

4.4.8 PASSWORD SETTING MENU

When you select this function, the following message will appear at the centre of the screen to assist you in creating a password.

ENTER PASSWORD:

Type the password, up to eight characters, and press <Enter>. The password typed now will clear any previously entered password from CMOS memory. You will be asked to confirm the password. Type the password again and press <Enter>. You may also press <Esc> to abort the selection and not enter a password.

To disable password, just press <Enter> when you are prompted to enter password. A message will confirm the password being disabled. Once the password is disabled, the system will boot and you can enter Setup freely.

PASSWORD DISABLED.

If you select System at Security Option of BIOS Features setup Menu, you will be prompted for password every time the system is rebooted or any time you try to enter Setup. If you select setup at Security Option of BIOS Features Setup Menu, you will be prompted only when you try to enter Setup.

4.4.9 IDE HDD AUTO DETECTION MENU

This function will automatically detect the information of the Hard Disk, and list them for your reference.

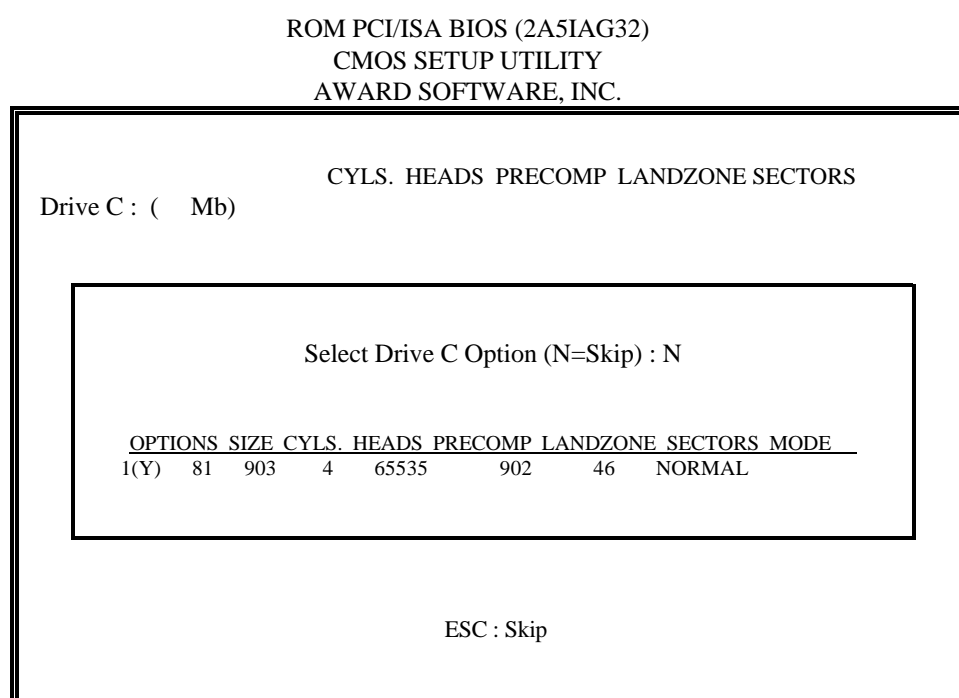


Fig 14

The BIOS support 3 HDD Mode, NORMAL, LBA & LARGE. **NORMAL** mode has the maximum 528MB HDD size; **LBA** (Logical Block Addressing) mode has the maximum 8.4GB HDD size; whereas **LARGE** mode has the maximum 1GB HDD size.

4.4.10 HDD LOW LEVEL FORMAT MENU

Three utilities are provided in the HDD Low Level Format menu:

- (1) SELECT DRIVE
- (2) BAD TRACK LIST
- (3) PREFORMAT

<p>Hard Disk Low Level Format Utility</p> <hr style="width: 50%; margin: auto;"/> <div style="border: 2px solid black; padding: 5px; width: fit-content; margin: 10px auto;"> <p>SELECT DRIVE BAD TRACK LIST PREFORMAT</p> </div> <p style="text-align: center; margin-top: 20px;">Current select drive is : C</p> <p style="text-align: center;">DRIVE : C CYLINDER : 0 HEAD : 0</p>	<p>BAD TRACKS TABLE</p> <hr style="width: 50%; margin: auto;"/> <p>NO. CYLS HEAD</p>																														
<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 15%;"></td> <td style="width: 15%;">163</td> <td style="width: 15%;">984.</td> <td style="width: 15%;">10S</td> <td style="width: 15%;">P65535P</td> <td style="width: 15%;">LA</td> <td style="width: 15%;">983E</td> <td style="width: 15%;">S</td> <td style="width: 15%;">34RS</td> <td style="width: 15%;">NORMAL</td> </tr> <tr> <td>Drive C:</td> <td>(0Mb)</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td></td> <td></td> <td>NORMAL</td> </tr> <tr> <td>Drive D:</td> <td>(Mb)</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </table>			163	984.	10S	P65535P	LA	983E	S	34RS	NORMAL	Drive C:	(0Mb)	0	0	0	0	0			NORMAL	Drive D:	(Mb)								
	163	984.	10S	P65535P	LA	983E	S	34RS	NORMAL																						
Drive C:	(0Mb)	0	0	0	0	0			NORMAL																						
Drive D:	(Mb)																														
<p>Up/Down-Select item ENTER-Accept ESC-Exit/Abort</p> <p>Copyright (c) Award Software, Inc. 1992-94 All Rights Reserved</p>																															

Fig 15A Setup Screen shown when "SELECT DRIVE" option is selected

Hard Disk Low Level Format Utility		BAD TRACKS TABLE
		NO. CYLS HEAD
<div style="border: 1px solid black; padding: 5px; display: inline-block;"> SELECT DRIVE BAD TRACK LIST PREFORMAT </div>		
Auto scan bad track Add bad track Modify bad track Delete bad track Clear bad track table DRIVE : C CYLINDER : 0 HEAD : 0		
Drive C:	163 984. 10S P65535P LA 983E S 34RS NORMAL (0Mb) 0 0 0 0 0 NORMAL	
Drive D:	(Mb)	
Up/Down-Select item		ENTER-Accept
		ESC-Exit/Abort
Copyright (c) Award Software, Inc. 1992-94 All Rights Reserved		

Fig 15B Setup Screen shown when "BAD TRACK LIST" option is selected

Hard Disk Low Level Format Utility		BAD TRACKS TABLE
		NO. CYLS HEAD
<div style="border: 1px solid black; padding: 5px; display: inline-block;"> SELECT DRIVE BAD TRACK LIST PREFORMAT </div>		
Interleave (1-8) : 0 (0 for auto detect) Auto scan bad track : N START : N DRIVE : C CYLINDER : 0 HEAD : 0		
Drive C:	163 984. 10S P65535P LA 983E S 34RS NORMAL (0Mb) 0 0 0 0 0 NORMAL	
Drive D:	(Mb)	
Up/Down-Select item		ENTER-Accept
		ESC-Exit/Abort
Copyright (c) Award Software, Inc. 1992-94 All Rights Reserved		

Fig 15C Setup Screen shown when "PREFORMAT" option is selected

4.4.11 SAVE & EXIT SETUP MENU

When you select this function, the following message will appear at the centre of the screen to assist you to Save data to CMOS and Exit the Setup.

SAVE to CMOS and EXIT (Y/N)?

4.4.12 EXIT WITHOUT SAVING MENU

When you select this function, the following message will appear at the centre of the screen to assist you to Abandon all Data and Exit Setup.

Quit Without Saving (Y/N)?

CHAPTER 5 BIOS POST MESSAGE

When the BIOS encounters an error that requires the user to correct something, either a beep code will sound or a message will be displayed in a box in the middle of the screen and the message **PRESS F1 TO CONTINUE, CTRL-ALT-ESC OR DEL TO ENTER SETUP** will be shown in the information box at the bottom.

5.1 POST BEEP

Currently there is only one beep code in BIOS. This code indicates that a video error has occurred and the BIOS cannot initialize the video screen to display any additional information. This beep code consists of a single long beep followed by two short beeps.

5.2 ERROR MESSAGES

One or more of the following messages may be displayed if the BIOS detects an error during the POST. This list includes message for both the ISA and the EISA BIOS.

CMOS BATTERY HAS FAILED:

CMOS battery is no longer functional. It should be replaced.

CMOS CHECKSUM ERROR:

Checksum of CMOS is incorrect. This can indicate that CMOS has become corrupt. This error may have been caused by a weak battery. Check the battery and replace if necessary.

DISK BOOT FAILURE, INSERT SYSTEM DISK AND PRESS ENTER:

No boot device was found. Insert a system disk into Drive A: and press <Enter>. If you assumed the system would boot from hard drive, make sure the controller is inserted correctly and all cables are properly attached. Also be sure the disk is formatted as a boot device. Then reboot the system.

DISKETTE DRIVES OR TYPES MISMATCH ERROR - RUN SETUP:

Type of diskette drive installed in the system is different from the CMOS definition. Run Setup to reconfigure the drive type correctly.

DISPLAY SWITCH IS SET INCORRECTLY:

Display switch on the motherboard can be set to either monochrome or color. This indicates the switch is set to a different setting than indicated in Setup. Determine which setting is correct, and then either turn off the system and change the jumper, or enter Setup and change the VIDEO selection.

DISPLAY TYPE HAS CHANGE SINCE LAST BOOT:

Since last powering off the system, the display adapter has been changes. You must configure the system for the new display type.

EISA Configuration Checksum Error**PLEASE RUN EISA CONFIGURATION UTILITY:**

The EISA non-volatile RAM checksum is incorrect or cannot correctly read the EISA slot. This can indicate either the EISA non-volatile memory has become corrupt or the slot has configured incorrectly. Also be sure the card is installed firmly in the slot.

EISA Configuration Is Not Complete**PLEASE RUN EISA CONFIGURATION UTILITY:**

The slot configuration information stored in EISA non-volatile memory is incomplete.

**** NOTE: When either of these errors appear, the system will boot in ISA mode, which allows you to run the EISA Configuration Utility.*

ERROR ENCOUNTERED INITIALIZING HARD DRIVE:

Hard drive cannot be initialized. Be sure the adapter is installed correctly and all cables are correctly and firmly attached. Also be sure the correct hard drive type is selected in Setup.

ERROR INITIALIZING HARD DISK CONTROLLER:

Cannot initialize controller. Make sure the cord is correctly and firmly installed in the bus. Be sure the correct hard drive type is selected in Setup. Also check to see if any jumper needs to be set correctly on the hard drive.

FLOPPY DISK CNTRLR ERROR OR NO CNTRLR PRESENT:

Cannot find or initialize the floppy drive controller. Make sure the controller is installed correctly and firmly. If there is no floppy drives installed, be sure the Diskette Drive selection in Setup is set to NONE.

Invalid EISA Configuration**PLEASE RUN EISA CONFIGURATION UTILITY:**

The non-volatile memory containing EISA configuration information was programmed incorrectly or has become corrupt. Re-run EISA configuration utility to correctly program the memory.

**** NOTE: When this error appears, the system will boot in ISA mode, which allows you to run the EISA Configuration Utility.*

KEYBOARD ERROR OR NO KEYBOARD PRESENT:

Cannot initialize the keyboard. Make sure the keyboard is attached correctly and no keys are being pressed during the boot.

If you are purposely configuring the system without a keyboard, set the error halt condition in Setup to HALT ON ALL, BUT KEYBOARD. This will cause the BIOS to ignore the missing keyboard and continue the boot.

Memory Address Error at ...:

Indicates a memory address error at a specific location. You can use this location along with the memory map for your system to find and replace the bad memory chips.

Memory parity Error at ...

Indicates a memory parity error at a specific location. You can use this location along with the memory map for your system to find and replace bad memory chips.

MEMORY SIZE HAS CHANGED SINCE LAST BOOT:

Memory has been added or removed since the last boot. In EISA mode use Configuration Utility to reconfigure the memory configuration. In ISA mode enter Setup and enter the new memory size in the memory fields.

Memory Verify Error at ...:

Indicates an error verifying a value already written to memory. Use the location along with your system's memory map to locate the bad chip.

OFFENDING ADDRESS NOT FOUND:

This message is used in conjunction with the I/O CHANNEL CHECK and RAM PARITY ERROR messages when the segment that has caused the problem cannot be isolated.

OFFENDING SEGMENT:

This message is used in conjunction with the I/O CHANNEL CHECK and RAM PARITY ERROR messages when the segment that has caused the problem has been isolated.

PRESS A KEY TO REBOOT:

This will be displayed at the bottom screen when an error occurs that required you to reboot. Press any key and the system will reboot.

PRESS F1 TO DISABLE NMI, F2 TO REBOOT:

When BIOS detects a Non-markable Interrupt condition during boot, this will allow you to disable the NMI and continue to boot, or you can reboot the system with the NMI enabled.

RAM PARITY ERROR - CHECKING FOR SEGMENT ...:

Indicates a parity error in Random Access Memory.

Should Be Empty But EISA Board Found

PLEASE RUN EISA CONFIGURATION UTILITY:

A valid board ID was found in a slot that was configured as having no board ID.

**** NOTE: When this error appears, the system will boot in ISA mode, which allows you to run the EISA Configuration Utility.*

Should Have EISA Board But Not Found**PLEASE RUN EISA CONFIGURATION UTILITY:**

The board installed is not responding to the ID request, or no board ID has been found in the indicated slot.

**** NOTE: When this error appears, the system will boot in ISA mode, which allows you to run the EISA Configuration Utility.*

Slot Not Empty:

Indicates that a slot designated as empty by the EISA Configuration Utility actually contains a board.

**** NOTE: When this error appears, the system will boot in ISA mode, which allows you to run the EISA Configuration Utility.*

SYSTEM HALTED, (CTRL-ALT-DEL) TO REBOOT ...:

Indicates the present boot attempt has been aborted and the system must be rebooted. Press and hold down the CTRL and ALT keys and press DEL.

Wrong Board In Slot**PLEASE RUN EISA CONFIGURATION UTILITY:**

The board ID does not match the ID stored in the EISA non-volatile memory.

**** NOTE: When this error appears, the system will boot in ISA mode, which allows you to run the EISA Configuration Utility.*

CHAPTER 6 BIOS DEFAULT DRIVE TABLE

This is a current list of the drive type table contained in Setup.

Type	Size (MB)	Cylns	Heads	Sects	Write Pcomp	Land Zone	Example Model
1	10	306	4	17	128	305	TEAC SD510, MMI 112, 5412
2	20	615	4	17	300	615	Seagate ST225, ST4026
3	30	615	6	17	300	615	
4	62	940	8	17	512	940	Seagate ST125, Tandon TM262
5	46	940	6	17	512	940	
6	20	615	4	17	None	615	
7	30	462	8	17	256	511	Tandon TM703
8	30	733	5	17	None	733	
9	112	900	15	17	None	901	
10	20	802	3	17	None	820	Disctron 526, MMI M125
11	35	855	5	17	None	855	
12	49	855	7	17	None	855	
13	20	306	8	17	128	319	
14	42	733	7	17	None	733	
15		Reserved					
16	20	612	4	17	0	663	Microscience HH725, Syquest 3250, 3425
17	40	977	5	17	300	977	Seagate ST4038
18	56	977	7	17	None	977	
19	59	1024	7	17	512	1023	Seagate ST4051 Seagate ST4096
20	30	733	5	17	300	732	
21	42	733	7	17	300	732	Maxtor 2085 Maxtor 2140, Priam S14
22	30	306	5	17	300	733	
23	10	977	4	17	0	336	Maxtor 2190, Priam S19
24	40	1024	5	17	None	976	
25	76	1224	9	17	None	1023	
26	71	1224	7	17	None	1223	
27	111	1224	11	17	None	1223	
28	152	1024	15	17	None	1223	

(TO BE CONTINUE)

Type	Size (MB)	Cylns	Heads	Sects	Write Pcomp	Land Zone	Example Model
29	68	1024	8	17	None	1023	Maxtor 1085, Micropolis 1325
30	93	918	11	17	None	1023	Maxtor 1105, 1120, 4780
31	83	925	11	17	None	1023	Maxtor 1170
32	69	1024	9	17	None	926	CDC 9415
33	85	1024	10	17	None	1023	
34	102	1024	12	17	None	1023	
35	110	1024	13	17	None	1023	
36	119	1024	14	17	None	1023	
37	17	1024	2	17	None	1023	
38	136	1024	16	17	None	1023	
39	114	918	15	17	None	1023	Maxtor 1140, 4380
40	40	820	6	17	None	820	Seagate ST251
41	42	1024	5	17	None	1023	Seagate 4053 Miniscribe 3053/6053
42	65	1024	5	26	None	1023	Miniscribe3053/6053 RLL
43	40	809	6	17	None	852	Miniscribe 3650
44	61	809	6	26	None	852	Miniscribe 3675 RLL
45	100	776	8	33	None	775	Conner CP3104
Auto	0	0	0	0	None	0	
User							

Table 23: Default Fixed Disk Table