PEM-0039N

386 CACHE MAINBOARD USER'S GUIDE

DTK Computer

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386 Cache Mainboard

User's Guide

Edition 1.00

ABOUT THIS GUIDE

This guide contains instructions for configuring and installing the PEM-0039N mainboard.

- Chapter 1, **Introduction**, acquaints user with the special features of the PEM-0039N mainboard.
- Chapter 2, **Hardware Configuration**, gives information on configuring memory and setting the mainboard's jumpers. Brief sections on installing memory and a math coprocessor are also included.
- 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, **Hard Disk Types**, provides a Default fixed Disk table.
- Chapter 6, **Error Codes**, provides references for all POST communicate errors.

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UNPACKING THE MAINBOARD

The PEM-0039N Mainboard comes packed in a sturdy cardboard shipping carton. The carton contains:

- The PEM-0039N Mainboard
- This User's Guide

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

The PEM-0039N 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

The PEM-0039N mainboard is a 1/2 body AT size high-performance mainboard that provides with the basic elements on which to build an advanced computer. This mainboard is fully IBM AT compatible, but has the added enhancement of a powerful 32-bit microprocessor.

The PEM-0039N mainboard is configured with the following microprocessors:

- 80386DX-33/40 PGA or PQFP CPU
- Cyrix 486DLC-25/33/40 CPU

1.1 KEY FEATURES

The advanced features of the PEM-0039N mainboard include:

- 100% IBM PC-AT compatible 1/2 AT size single chip 386 solution.
- Support 80386DX 33/40MHz PGA/PQFP CPU, or Cyrix 486DLC 25/33/40MHz CPU with 32-bit access to data.
- Support Co-processor 387DX or Cyrix 87DLC
- System Clock Speed: 25/33/40 MHz jumper selectable
- High performance single chip core logic with Internal Cache Controller.
- Built-in direct mapped secondary cache controller with option write-back or write-through operation and 0 wait state for cache hit.
- Optional cache memory size of 32/64/128KB.
- Two non-cacheable blocks ranging from 64K to 1MB.
- Optional caching of shadowed video BIOS.
- Memory configurations from 1MB to 128MB are possible using combinations of 256Kx9, 1Mx9, 4Mx9, and 16MX9 SIMM modules.
- Programmable 0/1/2 wait states for Read/Write cycle.
- On board DRAM up to 128M
- Hidden DRAM refresh.
- Support Page mode 256K, 1M, 4M, or 16M DRAM.
- C/D/E/F Seagate Shadow
- Support KB control Turbo/Deturbo mode select.
- Support 7 Direct Memory Access channels.
- Support 16 Interrupt levels.

- Five 16-bit I/O slots, One 8-bit AT Bus slots.
- 8MHz AT Bus Clock
- Support Hardware & Software Turbo Control
- Battery-backed CMOS memory for real time clock and system configuration.
- User Defined Password to inhibit illegal access.

1.2 MAINBOARD COMPONENTS

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

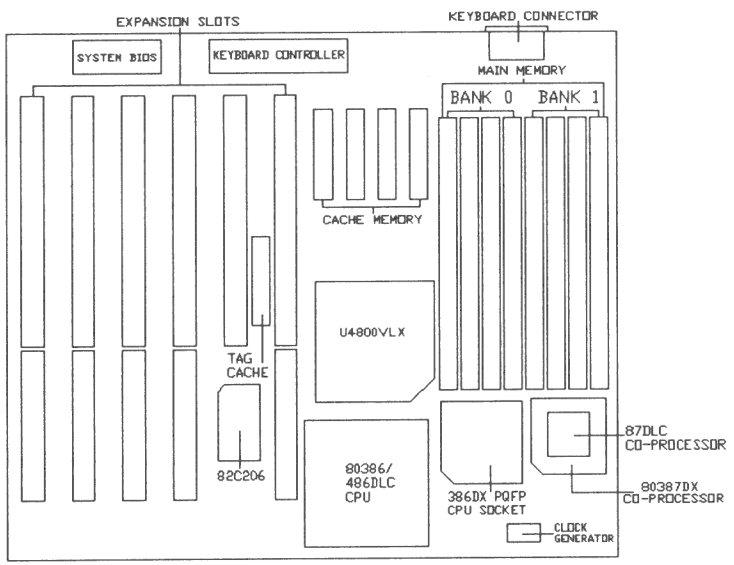


Fig 1 Key Components of the PEM-0039N Mainboard

CHAPTER 2 HARDWARE CONFIGURATION

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

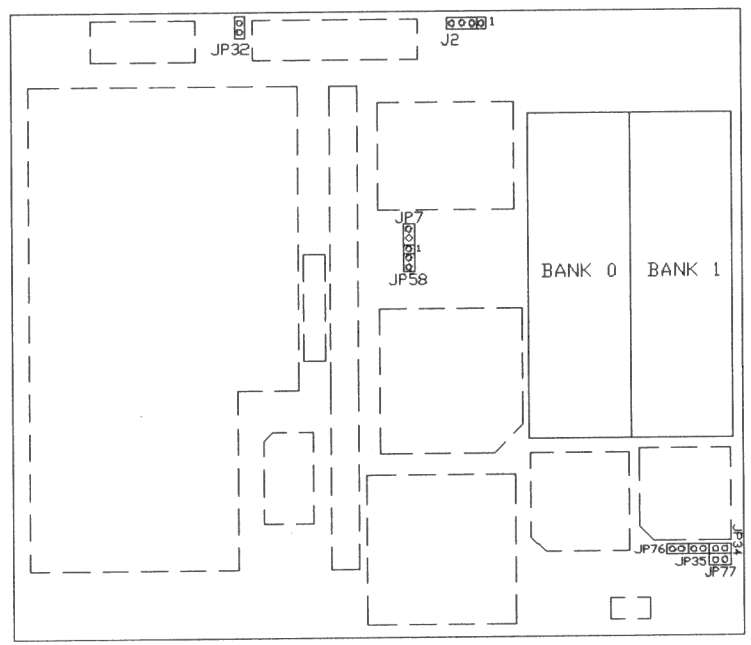


Fig 2 Jumper and Memory Bank Locations

2.2 JP76, JP35, JP34, JP77-CPU CLOCK SETTING

The PEM-0039N mainboard can support 80386DX, or 486DLC microprocessor. Jumpers JP76, JP35, JP34 and JP77 are required to setup different CPU Clock setting. Refer to Fig 2 for their location. Set the jumpers according to the following table:

JP76, JP35, JP34, JP77 -- CPU Clock Jumper

CPU CLOCK SETTING	JP76	JP35	JP34	JP77
50MHz	OPEN	CLOSE	OPEN	OPEN
66MHz	OPEN	OPEN	CLOSE	CLOSE
80MHz	CLOSE	OPEN	OPEN	CLOSE

Table 1: CPU Clock Jumper Setting

2.3 MATH COPROCESSOR INSTALLATION

The PEM-0039N mainboard has a 68-pin socket that supports the math coprocessor. See Fig 1 in Chapter 1 for the socket's location.
Installing math coprocessor as follows:

Caution: Static electricity can damage a math coprocessor.

1. Make sure that power to the mainboard is off and review the section on static electricity precautions at the beginning of this manual.
2. Align the coprocessor so that the notched corner of the chip matches the notched corner of the socket. The notched corner of the chip is marked by a round dot.

3. Carefully press the chip into the socket.

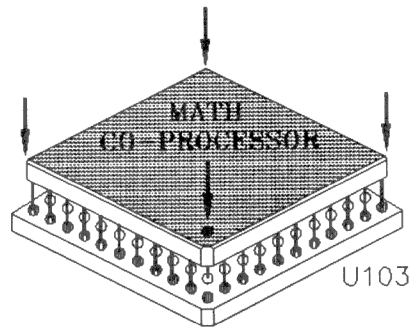


Fig 3 Installing Math Coprocessor

2.4 CACHE CONFIGURATION

The special feature of the PEM-0039N mainboard is a built-in direct-mapped cache controller with optional write-back or write-through operation which supports 32KB, 64KB, or 128KB cache memory.

The PEM-0039N 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 32KB, 64KB, and 128KB cache configurations. Cache size is selected by the hardware jumpers and the BIOS setup program.

2.4.1 UPGRADING CACHE

The PEM-0039N mainboard is available with an optional 32KB, 64KB, or 128KB cache memory on-board. User can upgrade cache memory by installing different SRAM (Static Random Access Memory) chips in sockets U53, U52, U51, U54, and U50.
The speed of the SRAM chips needed depends on the clock speed of the microprocessor:
25MHz CPU requires **25ns (tag)** and **25ns (data)** SRAM chips.
33MHz CPU requires **25ns (tag)** and **25ns (data)** SRAM chips.
40MHz CPU requires **20ns (tag)** and **20ns (data)** SRAM chips.

2.4.2 CACHE SIZE AND MEMORY LOCATIONS

The table below describes the chip capacity and socket location required for each cache size configuration. User can use 8Kx8-bit SRAM chips in the Tag RAM sockets. And 8Kx8-bit, 16Kx8-bit, or 32Kx8-bit SRAM chips in the data RAM socket. Please note that, do not combine different chip capacities.

Cache Size	U53	U52	U51	U54	U50 (TAG RAM)
32K	8Kx8	8Kx8	8Kx8	8Kx8	8Kx8
64K	16Kx8	16Kx8	16Kx8	16Kx8	8Kx8
128K	32Kx8	32Kx8	32Kx8	32Kx8	8Kx8

Table 2: Cache Size Configuration

2.4.3 CACHE CHIP SOCKETS AND JUMPER LOCATIONS

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

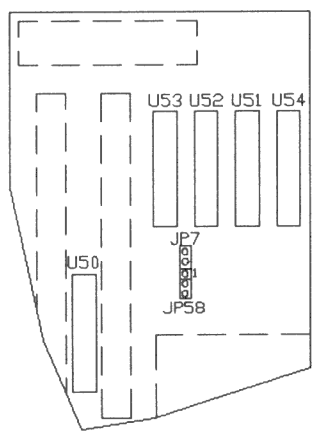


Fig 4 Cache Socket & Jumper Locations

2.4.4 JP58, JP7-CACHE JUMPER SETTING

Cache memory is configured using jumpers, JP58, JP7. The following table summarize the possible configuration.

JP58, JP7 -- Cache Jumper Setting

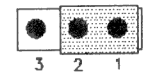
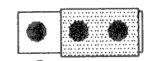
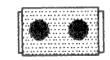
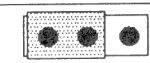
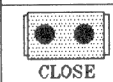
SRAM SIZE	JP58	JP7
32K		 OPEN
64K		 CLOSE
128K		 CLOSE

Table 3: Cache Jumper Setting

2.4.5 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.

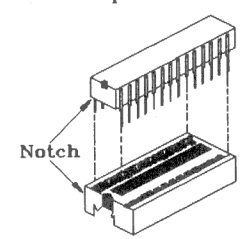


Fig 5 Installing a Cache Chip

2.5 JP32-MONITOR SETTING

Set the jumper, JP32, to configure the mainboard for either a color display card or a monochrome display. Short the jumper for a color display adapter. Open the jumper for a monochrome display adapter. Refer to Fig 2 for the location of JP32. Set the jumper as below.

JP32 -- Monitor Setting

MONITOR SETTING	JP32
Color Display (Default)	 CLOSE
Mono Display	 OPEN

Table 4

2.6 J2-CMOS RAM BATTERY SETTING & EXTERNAL BATTERY CONNECTOR

Jumper J2 can be setted as below. Refer to Fig 2 for the location of J2.

J2 -- CMOS RAM Battery Setting & External Battery Connector

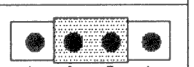
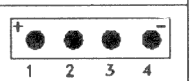
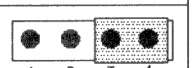
CMOS RAM BATTERY SETTING & EXTERNAL BATTERY CONNECTOR	J2
INTERNAL BATTERY (Default)	 1 2 3 4
EXTERNAL BATTERY CONNECTOR	 + − 1 2 3 4
DISCHARGE CMOS	 1 2 3 4

Table 5

2.7 MEMORY INSTALLATION

The PEM-0039N lets user add system memory via SIMM sockets on the mainboard. On-board memory is located in two banks: Bank 0 and Bank 1. See Fig 2.

Four SIMM sockets are provided in each bank. User can install either a 256K, 1M, 4M, or 16M SIMM in each 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:

Bank 0	Bank 1	Memory Size
256K	NONE	1MB
256K	256K	2MB
1M	NONE	4MB
256K	1M	5MB
1M	1M	8MB
4M	NONE	16MB
1M	4M	20MB
4M	1M	20MB
4M	4M	32MB
16M	NONE	64MB
4M	16M	80MB
16M	4M	80MB
16M	16M	128MB

Table 6: On-board Memory Configuration

2.8 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.

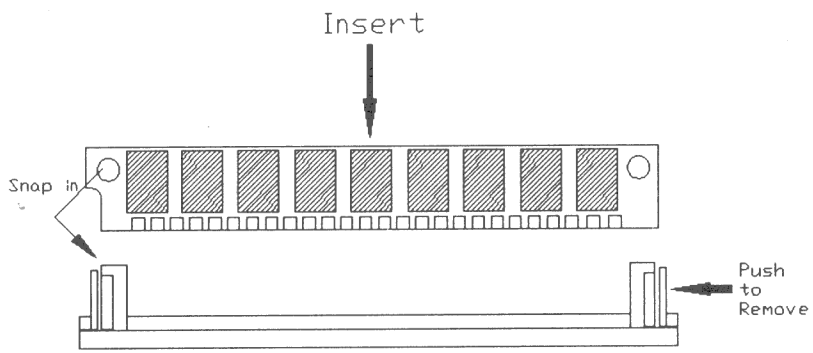


Fig 6 Installing a SIMM

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.

CHAPTER 3 MAINBOARD INSTALLATION

Once the PEM-0039N mainboard's hardware has been configured, the user is now ready to install the mainboard into the system chassis. This chapter describes what are needed to assemble an advanced computer system based on the PEM-0039N mainboard.

3.1 COMPONENTS

The following components are recommended:

- Case with standard chassis and hardware. The PEM-0039N fits most AT compatible cases.
- Standard AT power supply.
- 8 ohm speaker.
- Floppy disk drive(s) (360KB, 1.2MB, or 1.44MB).
- Hard disk drive (optional).
- Hard disk and floppy disk drive controller card.
- Flat ribbon cables to connect the disk drive controller and the disk drive(s).
- Serial/parallel interface card.
- AT-compatible keyboard.
- Video card and Display (monochrome, CGA, EGA, or VGA).

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 PEM-0039N 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 (J1) 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 mainboard connectors. The mainboard connectors have varying numbers of pins and are the points of contact between the mainboard and other parts of the computer.

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

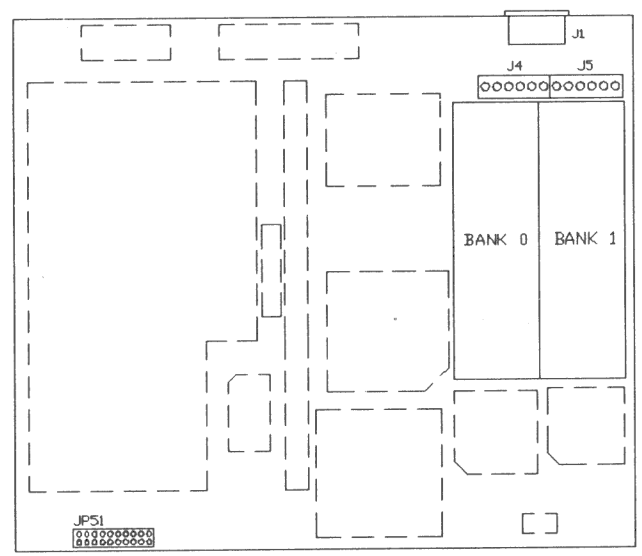


Fig 7 Connector Locations

3.4 CONNECTORS

3.4.1 J4/J5-POWER SUPPLY CONNECTOR

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

J4		J5	
Pin	Description	Pin	Description
1	Power Good	1	Ground
2	+5V DC	2	Ground
3	+12V DC	3	-5V DC
4	-12V DC	4	+5V DC
5	Ground	5	+5V DC
6	Ground	6	+5V DC

Table 7

3.4.2 J1-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 8

3.4.3 JP51-KEYLOCK, SPEAKER, LED, TURBO SWITCH, & RESET CONNECTOR

JP51 -- Keylock, Speaker, LED, Turbo Switch, & Reset Connector

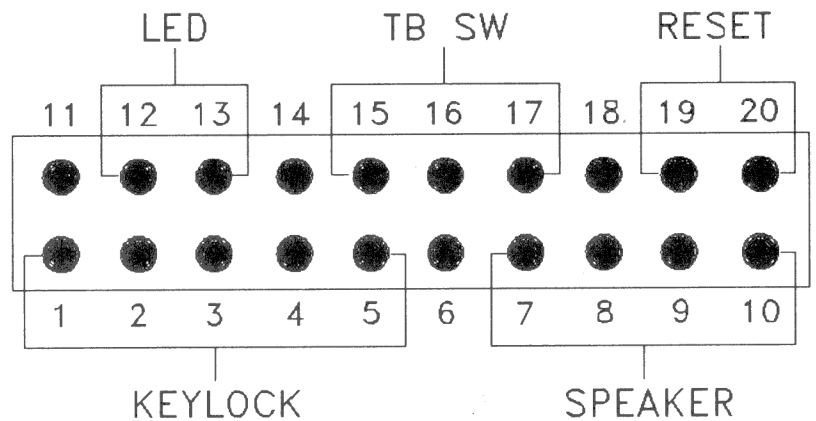


Fig 8

3.5 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, J4/J5.

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, J1.

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 AMI BIOS SETUP

The setup program provided with the mainboard is the AMI BIOS from American Megatrends Inc. Enter the AMI Setup program's Main Menu as follows:

1. Turn on or reboot the system. After a series of diagnostic checks, the following message appears:
   "Hit <DEL> if you want to run SETUP"

2. Press the <DEL> key to enter the AMI BIOS setup program and the following screen appears:

   STANDARD CMOS SETUP
   ADVANCED CMOS SETUP
   ADVANCED CHIPSET SETUP
   AUTO CONFIGURATION WITH BIOS DEFAULTS
   AUTO CONFIGURATION WITH POWER-ON DEFAULTS
   CHANGE PASSWORD
   HARD DISK UTILITY
   WRITE TO CMOS AND EXIT
   DO NOT WRITE TO CMOS AND EXIT

3. Choose an option and press <Enter>. Modify the system parameters to reflect the options installed in the system. (See the following sections for more information).

4. Press <ESC> at anytime to return to the Main Menu.

5. In the Main Menu, choose "WRITE TO CMOS AND EXIT" to save changes and reboot the system. Choosing "DO NOT WRITE TO CMOS AND EXIT" ignores all changes and exists the program.

4.1 STANDARD CMOS SETUP

Run the Standard CMOS Setup as follows.

1. Choose "STANDARD CMOS SETUP" from the Main Menu and a screen with a list of items appears.

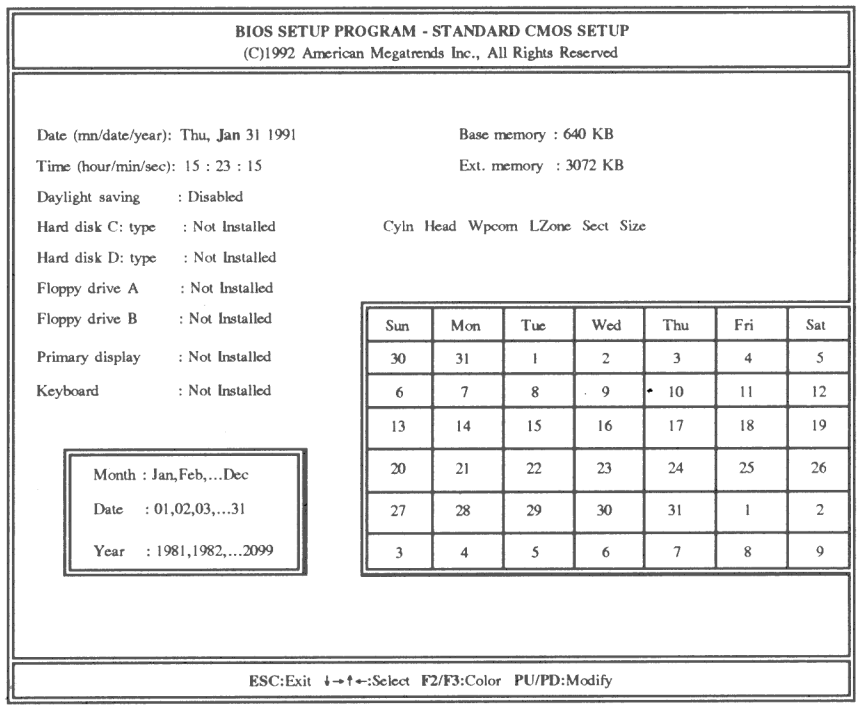


Fig 9 Standard CMOS Setup Screen

2. Use the arrow keys to move between items and to select values. Modify the selected fields using the PgUp/PgDn keys. Some fields let user enter numeric values directly.

3. After user finished with the Standard CMOS Setup program, press the <ESC> key. The following appears:

   "Write to CMOS and Exit (Y/N)?"

4. Typing "N" and <Enter> returns user to the Main Menu. Typing "Y" and <Enter> saves the system parameters and the system reboots.

4.2 ADVANCED CMOS SETUP

Run the Advanced CMOS Setup as follows.

1. Choose "ADVANCED CMOS SETUP" from the Main Menu and a screen with a list of items appears.

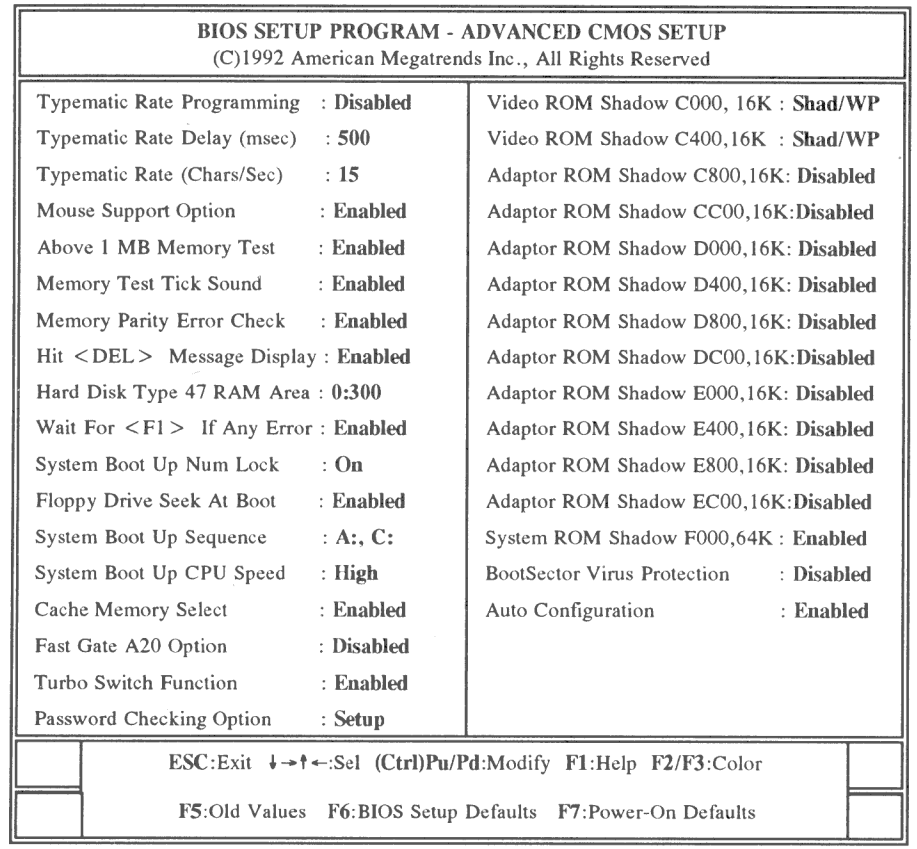


Fig 10A BIOS Setup Defaults for 80386DX CPU

BIOS SETUP PROGRAM - ADVANCED CMOS SETUP (C)1992 American Megatrends Inc., All Rights Reserved			
Typematic Rate Programming	: **Disabled**	Video ROM Shadow C000, 16K	: **Shad/WP**
Typematic Rate Delay (msec)	: **500**	Video ROM Shadow C400,16K	: **Shad/WP**
Typematic Rate (Chars/Sec)	: **15**	Adaptor ROM Shadow C800,16K	: **Disabled**
Mouse Support Option	: **Enabled**	Adaptor ROM Shadow CC00,16K	: **Disabled**
Above 1 MB Memory Test	: **Enabled**	Adaptor ROM Shadow D000,16K	: **Disabled**
Memory Test Tick Sound	: **Enabled**	Adaptor ROM Shadow D400,16K	: **Disabled**
Memory Parity Error Check	: **Enabled**	Adaptor ROM Shadow D800,16K	: **Disabled**
Hit <DEL> Message Display	: **Enabled**	Adaptor ROM Shadow DC00,16K	: **Disabled**
Hard Disk Type 47 RAM Area	: **0:300**	Adaptor ROM Shadow E000,16K	: **Disabled**
Wait For <F1> If Any Error	: **Enabled**	Adaptor ROM Shadow E400,16K	: **Disabled**
System Boot Up Num Lock	: **On**	Adaptor ROM Shadow E800,16K	: **Disabled**
Floppy Drive Seek At Boot	: **Enabled**	Adaptor ROM Shadow EC00,16K	: **Disabled**
System Boot Up Sequence	: **A:, C:**	System ROM Shadow F000,64K	: **Enabled**
System Boot Up CPU Speed	: **High**	BootSector Virus Protection	: **Disabled**
Cache Memory Select	: **Both**	Auto Configuration	: **Enabled**
Fast Gate A20 Option	: **Disabled**		
Turbo Switch Function	: **Enabled**		
Password Checking Option	: **Setup**		
ESC:Exit ↓→↑←:Sel **(Ctrl)Pu/Pd**:Modify **F1**:Help **F2/F3**:Color **F5**:Old Values **F6**:BIOS Setup Defaults **F7**:Power-On Defaults			

Fig 10B BIOS Setup Defaults for Cyrix 486DLC CPU

2. Use the arrow keys to move between items and to select values. Modify the selected fields by using the PgUp/PgDn keys. An explanation of the <F> keys follows:

   <F1>: "Help" gives options available for each item.

   <F2/F3>: Change color.

   <F5>: Get the old values. These values are the values with which the user started the current session. If the CMOS was good, then the old values are either the CMOS values or the BIOS Setup default values.

   <F6>: Load all options in the Advanced CMOS Setup / Advanced Chipset Setup with the BIOS Setup default values.

   <F7>: Load all options in the Advanced CMOS Setup / Advanced Chipset Setup with the Power-On default values.

3. After user has finished with the Advanced CMOS Setup program, press the <ESC> key. the following appears:
   "Write to CMOS and Exit (Y/N)?"

4. Typing "N" and <Enter> returns user to the Main Menu. typing "Y" and <Enter> saves the system parameters and the system reboots.

4.3 ADVANCED CHIPSET SETUP

The Advanced Chipset Setup option is used to change the values of the chipset registers. These registers control most of the system options in the computer.

Note: Change these settings only if user is familiar with the Chipset.

Run the Advanced Chipset Setup as follows:

1. Choose "ADVANCED CHIPSET SETUP" from the Main Menu and a screen with a list of items appears.

BIOS SETUP PROGRAM - ADVANCED CHIPSET SETUP
(C)1990 American Megatrends Inc., All Rights Reserved

Hidden Refresh	: **Enabled**	Cyrix Pin Enabled	: **Barb**
Slow Refresh	: **Disabled**		
Video BIOS Cache	: **Enabled**		
DRAM Read/Write	: **1 WS**		
SRAM Read	: **0 WS**		
SRAM Burst	: **Enabled**		
SRAM Write	: **0 WS**		
Master Cycle Swap	: **Disabled**		
IO Recovery Time	: **1ATCLK**		
AT Wait State	: **0 WS**		
AT Bus Clk	: **CLK2/6**		
Definition of Block 0	: **NonCache**		
Non-Cacheable Block-0 Size	: **0 KB**		
Non-Cacheable Block-0 Base	: **0000000H**		
Definition of Block 1	: **NonCache**		
Non-Cacheable Block-1 Size	: **0 KB**		
Non-Cacheable Block-1 Base	: **0000000H**		
Cyrix A20M Pin	: **Enabled**		

ESC:Exit ↓→↑←:Sel **(Ctrl)Pu/Pd**:Modify **F1**:Help **F2/F3**:Color
F5:Old Values **F6**:BIOS Setup Defaults **F7**:Power-On Defaults

Fig 11A Default Advanced Chipset Setup Screen for 80386DX 25MHz CPU

BIOS SETUP PROGRAM - ADVANCED CHIPSET SETUP
(C)1990 American Megatrends Inc., All Rights Reserved

Hidden Refresh	: **Enabled**	Cyrix Pin Enabled	: **Flush**
Slow Refresh	: **Disabled**		
Video BIOS Cache	: **Enabled**		
DRAM Read/Write	: **1 WS**		
SRAM Read	: **0 WS**		
SRAM Burst	: **Enabled**		
SRAM Write	: **0 WS**		
Master Cycle Swap	: **Disabled**		
IO Recovery Time	: **1ATCLK**		
AT Wait State	: **0 WS**		
AT Bus Clk	: **CLK2/6**		
Definition of Block 0	: **NonCache**		
Non-Cacheable Block-0 Size	: **0 KB**		
Non-Cacheable Block-0 Base	: **0000000H**		
Definition of Block 1	: **NonCache**		
Non-Cacheable Block-1 Size	: **0 KB**		
Non-Cacheable Block-1 Base	: **0000000H**		
Cyrix A20M Pin	: **Enabled**		

ESC:Exit ↓→↑←:Sel **(Ctrl)Pu/Pd**:Modify **F1**:Help **F2/F3**:Color
F5:Old Values **F6**:BIOS Setup Defaults **F7**:Power-On Defaults

Fig 11B Default Advanced Chipset Setup Screen for Cyrix 486DLC 25MHz CPU

BIOS SETUP PROGRAM - ADVANCED CHIPSET SETUP (C)1990 American Megatrends Inc., All Rights Reserved			
Hidden Refresh	: **Enabled**	Cyrix Pin Enabled	: **Barb**
Slow Refresh	: **Disabled**		
Video BIOS Cache	: **Enabled**		
DRAM Read/Write	: **1 WS**		
SRAM Read	: **0 WS**		
SRAM Burst	: **Enabled**		
SRAM Write	: **0 WS**		
Master Cycle Swap	: **Disabled**		
IO Recovery Time	: **1ATCLK**		
AT Wait State	: **0 WS**		
AT Bus Clk	: **CLK2/8**		
Definition of Block 0	: **NonCache**		
Non-Cacheable Block-0 Size	: **0 KB**		
Non-Cacheable Block-0 Base	: **0000000H**		
Definition of Block 1	: **NonCache**		
Non-Cacheable Block-1 Size	: **0 KB**		
Non-Cacheable Block-1 Base	: **0000000H**		
Cyrix A20M Pin	: **Enabled**		
ESC:Exit ↓→↑←:Sel **(Ctrl)Pu/Pd**:Modify **F1**:Help **F2/F3**:Color **F5**:Old Values **F6**:BIOS Setup Defaults **F7**:Power-On Defaults			

Fig 11C Default Advanced Chipset Setup Screen for 80386DX 33MHz CPU

BIOS SETUP PROGRAM - ADVANCED CHIPSET SETUP (C)1990 American Megatrends Inc., All Rights Reserved			
Hidden Refresh	: **Enabled**	Cyrix Pin Enabled	: **Flush**
Slow Refresh	: **Disabled**		
Video BIOS Cache	: **Enabled**		
DRAM Read/Write	: **1 WS**		
SRAM Read	: **0 WS**		
SRAM Burst	: **Enabled**		
SRAM Write	: **0 WS**		
Master Cycle Swap	: **Disabled**		
IO Recovery Time	: **1ATCLK**		
AT Wait State	: **0 WS**		
AT Bus Clk	: **CLK2/8**		
Definition of Block 0	: **NonCache**		
Non-Cacheable Block-0 Size	: **0 KB**		
Non-Cacheable Block-0 Base	: **0000000H**		
Definition of Block 1	: **NonCache**		
Non-Cacheable Block-1 Size	: **0 KB**		
Non-Cacheable Block-1 Base	: **0000000H**		
Cyrix A20M Pin	: **Enabled**		
ESC:Exit ↓→↑←:Sel **(Ctrl)Pu/Pd**:Modify **F1**:Help **F2/F3**:Color **F5**:Old Values **F6**:BIOS Setup Defaults **F7**:Power-On Defaults			

Fig 11D Default Advanced Chipset Setup Screen for Cyrix 486DLC 33MHz CPU

BIOS SETUP PROGRAM - ADVANCED CHIPSET SETUP (C)1990 American Megatrends Inc., All Rights Reserved			
Hidden Refresh	: **Enabled**	Cyrix Pin Enabled	: **Barb**
Slow Refresh	: **Disabled**		
Video BIOS Cache	: **Enabled**		
DRAM Read/Write	: **2 WS**		
SRAM Read	: **0 WS**		
SRAM Burst	: **Enabled**		
SRAM Write	: **1 WS**		
Master Cycle Swap	: **Disabled**		
IO Recovery Time	: **1ATCLK**		
AT Wait State	: **0 WS**		
AT Bus Clk	: **CLK2/10**		
Definition of Block 0	: **NonCache**		
Non-Cacheable Block-0 Size	: **0 KB**		
Non-Cacheable Block-0 Base	: **0000000H**		
Definition of Block 1	: **NonCache**		
Non-Cacheable Block-1 Size	: **0 KB**		
Non-Cacheable Block-1 Base	: **0000000H**		
Cyrix A20M Pin	: **Enabled**		
ESC:Exit ↓→↑←:Sel **(Ctrl)Pu/Pd**:Modify **F1**:Help **F2/F3**:Color **F5**:Old Values **F6**:BIOS Setup Defaults **F7**:Power-On Defaults			

Fig 11E Default Advanced Chipset Setup Screen for 80386DX 40MHz CPU

BIOS SETUP PROGRAM - ADVANCED CHIPSET SETUP (C)1990 American Megatrends Inc., All Rights Reserved			
Hidden Refresh	: **Enabled**	Cyrix Pin Enabled	: **Flush**
Slow Refresh	: **Disabled**		
Video BIOS Cache	: **Enabled**		
DRAM Read/Write	: **2 WS**		
SRAM Read	: **0 WS**		
SRAM Burst	: **Enabled**		
SRAM Write	: **1 WS**		
Master Cycle Swap	: **Disabled**		
IO Recovery Time	: **1ATCLK**		
AT Wait State	: **0 WS**		
AT Bus Clk	: **CLK2/10**		
Definition of Block 0	: **NonCache**		
Non-Cacheable Block-0 Size	: **0 KB**		
Non-Cacheable Block-0 Base	: **0000000H**		
Definition of Block 1	: **NonCache**		
Non-Cacheable Block-1 Size	: **0 KB**		
Non-Cacheable Block-1 Base	: **0000000H**		
Cyrix A20M Pin	: **Enabled**		
ESC:Exit ↓→↑←:Sel **(Ctrl)Pu/Pd**:Modify **F1**:Help **F2/F3**:Color **F5**:Old Values **F6**:BIOS Setup Defaults **F7**:Power-On Defaults			

Fig 11F Default Advanced Chipset Setup Screen for Cyrix 486DLC 40MHz CPU

2. Use the arrow keys to move between items select values. Modify selected fields using the PgUp/PgDn keys. An explanation of the <F> keys are shown on pg21 of this manual.

3. After finishing with the Advance Chipset Setup, press the <ESC> key. The following appears:

"Write to CMOS and Exit (Y/N)?"

4. Typing "N" and <Enter> returns user to the Main Menu. Typing "Y" and <Enter> saves the system parameters and the system reboots.

4.4 AUTO CONFIGURATION WITH BIOS DEFAULTS

This Main Menu item loads the default system values. If the CMOS is corrupted the defaults will load automatically. Choose this item and the following message appears:

"Load BIOS Setup Default Values from ROM Table (Y/N)? N"

To use the BIOS defaults, change the prompt to "Y" and press <Enter>. The following message appears:

"Default values loaded. Press any key to continue."

4.5 AUTO CONFIGURATION WITH POWER-ON DEFAULTS

This Main Menu item uses the default Power-On values. Use this option as a diagnostic aid if the system behaves erratically. Choose this item and the following message appears:

"Load Power-On Default Values (Y/N)? N"

To use the Power-On defaults, change the prompt to "Y" and press <Enter>. The following message appears:

"Default values loaded. Press any key to continue."

4.6 CHANGE PASSWORD

The Main Menu item lets user to configure the system so that a password is required every time the system boots or an attempt is made to enter the Setup program.

The password cannot be longer than 6 ASCII characters. A default password is stored in the ROM in case the CMOS is corrupted. The default password is <AMI>. To change the password choose "Change Password" in the Main Menu and press <Enter>.

When user next boot the system, after saving changed value to CMOS, user will be prompted for the password.

If user is not prompted for the password, check that the "Password Checking Option" in the Advanced CMOS Setup is configured for "Always" or "Setup". See the section above on "Advanced CMOS Setup."

When the password prompt appears, key in the new password and press <Enter>. If loose or disconnected batteries corrupt the CMOS, use the default password, <AMI> instead.

Important: Keep a safe record of the new password. If forget or lose the password, the only way to access the system is to disconnect the CMOS batteries and then re-use the default password <AMI>.

4.7 HARD DISK UTILITY

This Main Menu item gives user three options for analyzing and formatting a hard disk. The three options are:

- **Hard Disk Format** - performs a "low level" format of the hard disk. Check with the hard drive manufacturer to see if this option is required.

- **Auto Interleave** - determines optimum interleave factor before formatting the hard disk.

- **Media Analysis** - analyzes each track of the hard drive. Marks unusable tracks as "bad" to prevent future data storage on those tracks.

Error messages specific to the Hard Disk Utility options may appear during initialization or operation. Refer to Chapter 6 for a list of these messages.

Warning: *Performing any one of these options destroys all data on the hard disk. User must back-up the hard disk before performing any of these tests.*

Notes: 1. *System documentation of brand new hard disk usually provides a list of "bad tracks" as well as the optimum interleave factor.*

2. *These options are not valid for a SCSI Disk Drive.*

CHAPTER 5 HARD DISK TYPES

The AMI BIOS supports the following hard disk types.

Type	Cyln	Head	WPrec	LZone	Sect	Cap (MB)
1	306	4	128	305	17	10MB
2	615	4	300	615	17	20MB
3	615	6	300	615	17	31MB
4	940	8	512	940	17	62MB
5	940	6	512	940	17	47MB
6	615	4	65535	615	17	20MB
7	462	8	256	511	17	31MB
8	733	5	65535	733	17	30MB
9	900	15	65535	901	17	112MB
10	820	3	65535	820	17	20MB
11	855	5	65535	855	17	35MB
12	855	7	65535	855	17	50MB
13	306	8	128	319	17	20MB
14	733	7	65535	733	17	43MB
15	0	0	0	0	0	0MB
16	612	4	0	663	17	20MB
17	977	5	300	977	17	41MB
18	977	7	65535	977	17	57MB
19	1024	7	512	1023	17	60MB
20	733	5	300	732	17	30MB
21	733	7	300	732	17	43MB
22	733	5	300	733	17	30MB
23	306	4	0	336	17	10MB
24	925	7	0	925	17	54MB
25	925	9	65335	925	17	69MB

(TO BE CONTINUED)

Type	Cyln	Head	WPrec	LZone	Sect	Cap (MB)
26	754	7	754	754	17	44MB
27	754	11	65535	754	17	69MB
28	699	7	256	699	17	41MB
29	823	10	65535	823	17	68MB
30	918	7	918	918	17	53MB
31	1024	11	65535	1024	17	94MB
32	1024	15	65535	1024	17	128MB
33	1024	5	1024	1024	17	43MB
34	612	2	128	612	17	10MB
35	1024	9	65535	1024	17	77MB
36	1024	8	512	1024	17	68MB
37	615	8	128	615	17	41MB
38	987	3	987	987	17	25MB
39	987	7	987	987	17	57MB
40	820	6	820	820	17	41MB
41	977	5	977	977	17	41MB
42	981	5	981	981	17	41MB
43	830	7	512	830	17	48MB
44	830	10	65535	830	17	69MB
45	917	15	65535	918	17	114MB
46	1224	15	65535	1223	17	152MB
47	USER DEFINE TYPE					

Table 9: Default Fixed Disk Table

CHAPTER 6 ERROR CODES

Every time when power on the system, the POST (Power On Self Test) diagnostic routines will check to make sure the system is running properly. During boot-up, the POST communicate errors to the user as either a series of beeps, or as messages on the display screen. Fatal errors do not let the system complete boot-up, and are usually signalled as a series of beeps, since the display may not come on. Non-fatal errors allow boot-up to continue, and error messages appear on the screen.

6.1 BEEP ERROR CODES

These codes are emitted as a series of audible beeps. All Beep Error Codes, except for number 8, are fatal errors. If the system does not boot-up and starts beeping, write down the number of beeps that had heard and consult an authorized repair person.

Beep Error Codes and their meanings follow:

Number of Beeps	Error Message
1	Refresh Failure
2	Parity Error
3	Base 64 KB Memory Failure
4	Timer Not Operational
5	Processor Error
6	8042 - Gate A20 Failure
7	Processor Exception Interrupt Error
8	Display Memory Read/Write Error
9	ROM Checksum Error
10	CMOS Shutdown Register Read/Write Error

Table 10

6.2 ERROR MESSAGES

Non-fatal Error Messages usually appear on the screen as follows:
ERROR Message Line 1
ERROR Message Line 2
Press <F1> to RESUME
After user note the Error Message, then press the <F1> key to allow the system to proceed with boot-up. A list of Error Messages follows:

Message	Action
CMOS Battery State Low	Replace the battery.
CMOS Checksum Failure	Run the BIOS SETUP program.
CMOS System Options Not Set	Run the BIOS SETUP program.
CMOS Display Type Mismatch	Run the BIOS SETUP program.
Display Switch Not Proper	Properly set the video switch on the mainboard to monochrome or color.
Keyboard Is Locked...Unlock It	Unlock the keyboard lock to continue boot-up.
Keyboard Error	Make sure to have the AMI keyboard BIOS installed, or set the Standard CMOS Setup's "Keyboard" option to "Not Installed".
CMOS Memory Size Mismatch	Run the BIOS SETUP program.
FDD Controller Failure	Check all connections after the system is powered off.
HDD Controller Failure	Check all connections after the system is powered off.
C: Drive Error	Check Standard CMOS Setup to see if correct hard disk is selected.
D: Drive Error	Check Standard CMOS Setup to see if correct hard disk is selected.
CMOS Time & Date Not Set	Check Standard CMOS Setup to see if correct date and time are selected.
Diskette Boot Failure	Use another boot disk.
Invalid Boot Diskette	Use another boot disk.

Message	Action
On Board Parity Error	Use memory diagnostic software, such as AMIDIAG, to find and correct memory problems.
Off Board Parity Error	Use memory diagnostic software, such as AMIDIAG, to find and correct memory problems.
Parity Error ????	Use memory diagnostic software, such as AMIDIAG, to find and correct memory problems.

Table 11

Note: For any other error messages please consult an authorised repair person.

6.3 HARD DISK UTILITY ERROR MESSAGES

The following error messages may appear during the Hard Disk Utility routines of the BIOS Setup program. The first four messages may appear during initialization; the rest may appear during operations.

Message	Action
No Hard Disk Installed	Check if hard disk is on the system.
Fatal Error Bad Hard Disk	Check all cables and power connections.
Hard Disk Controller Failure	Check that the controller is properly inserted in the BUS slot.
C: (D:) Hard Disk Failure	Check all cables and power connections.
Drive Parameter Activity Failed	Check to see if the proper drive type is selected in the Standard CMOS Setup.

Table 12

Note: For any other error messages please consult an authorised repair person.