

**KP 486SX/DX
Mainboard**

MORSE

Operation Manual



Contents

**KP 486SX/DX
Mainboard
(Ver. 2.00)**

Operation Manual

November, 1991

How to Use This Manual

This manual covers all necessary information to operate your system board. It will assist you in the installation and configuration of the system. By carefully following the steps described in this manual, the user should be able to handle the system without additional help.

The table of contents gives detailed information about the arrangement of this manual:

- Chapter I** An introduction to the mainboard, which provides a detailed feature list.
- Chapter II** Quick reference for connectors and jumper settings.
- Chapter III** Provides information necessary for system memory installation and configuration.
- Chapter IV** Shows the setup procedures for the cache memory system.
- Chapter V** Shows CMOS RAM Setup procedures.
- Chapter VI** Questions and answers for servicing your system.

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Chapter I

Introduction

Your 486SX/DX mainboard is a fully PC/AT compatible system board implemented with a highly integrated chip set.

With 64K, 128K or 256K cache memory on-board, your mainboard is powerful enough for demanding applications and is well suited for building advanced personal computers or workstations.

Two banks of SIMM sockets are provided for the memory module and up to 32M bytes of memory can be installed on-board. Enhanced options including cache and shadow RAM functions are provided. Your mainboard also supports 256K memory relocation.

Your system board supports the Weitek 4167 floating-point coprocessor, thereby allowing users to upgrade the system to a workstation platform, or to optimize applications such as financial modeling, spread-sheets, CAD/CAM or advanced graphics.

The system board supports DOS Conventional memory and Extended memory (running in protected mode) functions and is fully compatible with XT, 286 AT and 386 software. It also supports MS-DOS, PC-DOS, OS/2, Xenix, Unix, Novell Networking and IBM PC/AT compatible application programs.

I-1 Features

- **CPU:** 80486DX 33/25MHz or 80486SX 25/20/16MHz CPU
- **Chipset:** MORSE 91A401 and MORSE91A402 which contain:
 - Cache controller — 0 wait state memory access if cache hit
 - Memory controller — fast page mode operation
 - Bus controller — fully PC/AT compatible
- **Coprocessor:** Weitek 4167 and 487SX floating-point coprocessor
- **Cache:** 64K, 128K or 256K
- **Shadow RAM:** for system BIOS and video BIOS
- **Memory (DRAM):** 2 memory bank on-board
 - Supports 1MB up to 32MB memory
 - DRAM speed: 80 ns or 100 ns (fast page mode)
- **BIOS:** AMI window-look BIOS.
- **Expansion Slot:** six 16-bit and two 8-bit expansion slots
- Software bus speed selection for maximum compatibility with add-on cards
- Dual processing speed selection
 - Turbo mode : 33/25 MHz (for 486DX) or 25/20/16 MHz (for 486SX)
 - Non-turbo mode: 16.5/12.5MHz(for 486DX) or 12.5/10/8 MHz (for 486SX)
- Supports multi-user and multi-tasking operating system such as Xenix, Unix, Novell and OS/2

I-2 System Performance

Table 1. Performance (486 DX with 64KB Secondary Cache)

Software	33MHz System (With 66MHz Osc.)	25MHz System (With 50MHz Osc.)
Landmark V 1.14	150.2	114.1
Landmark V 2.00	110.40	83.63
Power Meters V 1.5	14.763 MIPS	11.232 MIPS

Table 2. Performance (486 SX with 64KB Secondary Cache)

Software	25MHz System (With 50MHz Osc.)	20MHz System (With 40MHz Osc.)	16MHz System (With 32MHz Osc.)
Landmark V 1.14	114.1	91.2	72.6
Landmark V 2.00	83.63	66.90	53.52
Power Meters V 1.5	11.232 MIPS	8.960 MIPS	7.164 MIPS

Chapter II

Hardware Configuration

This chapter contains installation procedures, the mainboard layout, in addition to jumper and connector settings.

II-1 Check List

Upon receipt of your mainboard kit, inspect the package for evidence of damage during transportation. Open the package and inspect the board for visible damage such as scratches, loose components or broken components. If there is damage, notify your supplier immediately and ask for a replacement. Besides this manual, you should have received your mainboard. If any of these items are missing or damaged, please contact your dealer.

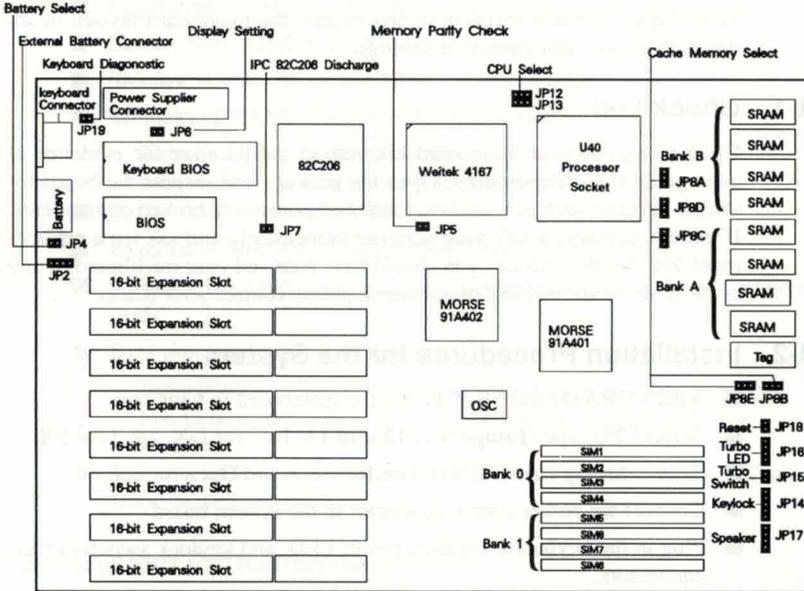
II-2 Installation Procedures for the System

- Attach DRAMs and SRAMs. Fix the mainboard to your case.
- Select CPU type (**Jumpers JP12 and 13**: 1&2 for DX, 2& 3 for SX)
- Select display mode (**JP6**: Close for mono and Open for color).
- Connect the power supply connector to the system board.
- Plug in the keyboard, speaker, power LED, and keylock switch to their connectors.
- Install FDD and HDD, and attach their cables to the controller.
- Firmly plug the FDD/HDD controller into a slot.
- Install the display card.
- Connect the monitor cable to the display card.
- Check all screws and make sure that all parts are properly fixed.
- Execute the Setup program by pressing the key after Power On Self Test.
- Enter Standard CMOS Setup to set up time, date, hard disk type, and display type.
- Load BIOS Default Values and make modifications from that point. If you have any trouble after modifications, reload the default settings again.

II-3 Mainboard Layout

Your mainboard is a standard baby-sized board. The figure below shows the physical layout for this mainboard.

Figure 1. Mainboard Layout



- Note:**
1. This mainboard is designed for both 486SX and 486DX CPUs. Either a 486SX CPU or a 486DX CPU may be installed on-board. Socket U40 is the socket for the 486SX CPU, the 486DX CPU as well as the 487SX coprocessor.
 2. If you upgrade your system with 486DX CPU, you should change the oscillator in socket Y2. Refer to the table below for the appropriate OSC.

System	Oscillator
16MHz	32MHz
20MHz	40MHz
25MHz	50MHz

II-4 Quick Reference for the Connectors' Functions

Connector	Function & Description
JP1	Keyboard connector
JP2	External 6-V battery connector
JP3	Power supply connector
JP14	Keylock and power LED connector
JP15	Turbo switch, (Close: Turbo , Open: Non-turbo)
JP16	Turbo LED
JP17	Speaker connector
JP18	Hardware Reset connector

II-5 Quick Reference for Jumper Settings

Jumper	Function & Description
JP4	Battery Selection (When JP2 is connected to an external battery) Open — if connected to 6V external battery Close — if connected to 3.6V external battery
JP5	Parity Check *Close— parity enabled (if your SIMM modules include parity RAM) Open—parity disabled (if your SIMM modules do not include parity RAM)
JP6	Display Mode Setting *Open — Color Close — Mono
JP7	IPC(82C206) Discharge Close — to discharge 82C206's CMOS memory *Open — to maintain setup data in 82C206 for normal functioning
JP12 & JP13	CPU Selection Pins 1 and 2 Close — 486DX CPU or 487SX Pins 2 and 3 Close —486SX CPU
JP19	Keyboard Diagnostic Close — for system dynamic burning test Open — (factory default)

Jumper	Cache Memory Size Select		
	64K Cache Memory	128K Cache Memory	256K Cache Memory
JP18A	Pins 2 and 3 Close	Pins 1 and 2 Close	Pins 2 and 3 Close
JP18D	Pins 2 and 3 Close	Pins 1 and 2 Close	Pins 2 and 3 Close
JP18C	Pins 2 and 3 Close	Pins 1 and 2 Close	Pins 2 and 3 Close
JP18B	Pins 2 and 3 Close	Pins 1 and 2 Close	Pins 1 and 2 Close
JP18E	Pins 2 and 3 Close	Pins 1 and 2 Close	Pins 1 and 2 Close

II-6 Guide for Attaching Connectors

The following sections give detailed information about the connectors. Refer to *Figure 1. Mainboard Layout* for the locations of the connectors.

Keyboard Connector

This connector is located at the back of your system unit. Any AT-compatible keyboard with a 5-pin DIN connector may be used.

External Battery Connector

Occasionally, users wish to add an additional replaceable external battery to back up the CMOS RAM. This connector is for the external battery.

Keylock and Power On LED Indicator Connector

This connector has two functions:

- The Power On LED Indicator (pins 1 and 3)
- The keyboard lock (pins 4 and 5) which is usually connected to the key switch on your control panel by wires. When pins 4 and 5 are Closed, the keyboard is inhibited.

Speaker Connector

This connector is usually connected to the speaker in the chassis by wires.

Hardware Reset Connector

This connector is usually connected to a button switch on the front panel by wires, the user just pushes the button to reset. There are two ways to reset the system: the hardware reset (by pressing the reset button, thereby closing this jumper), and the software reset (by pressing <Ctrl>, <Alt>, and simultaneously on the keyboard).

Turbo LED

This connector is connected to a Turbo LED on the front panel by wires so that this LED will illuminate in turbo mode. Turbo Mode means faster system speed and Normal Mode is the slower system speed.

Turbo Switch

This jumper is a hardware toggle-switch used for switching the Turbo and normal mode (Open: Non-Turbo, Close: Turbo). There are three choices for this jumper—1) set Close with a jumper cap, 2) left open, or 3) connected to a push-button type toggle switch on the front panel by wires.

Power Supply Connector

There is a 12-pin male connector linking the mainboard to the power supply. When you attach the power cables, be sure the four black wires from the power supply are located at the middle of the power supply connector.

Figure 2. Pin Assignments for Connectors

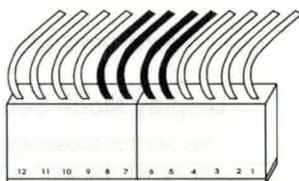
Keylock and Power LED

- 1 ● Power LED
- No Connection
- Ground
- Keyboard Lock
- Ground

External Battery

- 1 ● Battery Positive
- No Connection
- Ground
- Ground

Power Supplier Connector



Reset

- 1 ● Reset Control
- Ground

Speaker

- 1 ● Speaker Data
- No Connection
- Ground
- +5V DC

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

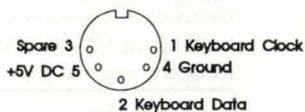
Turbo LED

- 1 ● Pullup (+5V DC)
- Turbo Control
- Pullup (+5V DC)
- Turbo Control

Turbo Switch

- 1 ● Pullup (+5V DC)
- Turbo Control

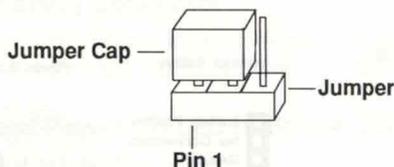
Keyboard Connector



II-7 Guide for Jumper Settings

Jumper

A jumper is a kind of switch which uses a plastic cap with a metal interior to connect (short) two pins. If a jumper needs to be left open, you should save the cap for future use by covering only one pin of the jumper. This has no effect on the function of the board while it keeps the cap handy. The illustration below shows the side view of a three pin jumper in which pins 1 and 2 are Close.



Display Mode Setting (JP6)

This jumper is used to determine the type of display adapter attached. Following are the settings.

Jumper	Setting	Mode	Adapter Attached
JP6	*Open (default)	Color	CGA, EGA, VGA, EVGA
JP6	Close	Mono	Monochrome, Hercules

Battery Selection (JP4)

Occasionally, users wish to add an additional replaceable external battery to back up the CMOS RAM. This jumper determines whether your system is using the external 3.6V battery or the 6V battery.

JP4	Description
*Close (default)	When jumper J2 is connected to the external 3.6V battery
Open	When jumper JP2 is connected to the external 6V battery.

CPU Selection (JP12, JP13)

This mainboard is designed for both 486SX and 486DX CPUs. Either a 486SX CPU or a 486DX CPU may be installed on-board. Jumpers JP12 and JP13 determine which CPU is used.

JP12	JP13	Function
1 and 2 Close	1 and 2 Close	486DX or 487SX
2 and 3 Close	2 and 3 Close	486SX

Chapter III

Setting Up System Memory

Your system board has two SIMM banks on-board, supporting 30-pin single-in-line 256K, 1M, or 4M bit DRAMs. Each SIMM Bank needs 4 packs of SIMM module. Your mainboard can support up to 32M bytes on-board memory. When you install DRAM modules, you should follow one rule, that is, Bank 0 must be full before you install Bank 1.

III-1 Possible On-Board Memory Configurations

The table below shows the possible DRAM configurations.

Table 3. Possible On-Board Memory Configurations

Bank 0	Bank 1	Total On-Board Memory
Four 256K SIMMs	x	1MB
Four 256K SIMMs	Four 256K SIMMs	2MB
Four 256K SIMMs	Four 1M SIMMs	5MB
Four 1M SIMMs	x	4MB
Four 1M SIMMs	Four 1M SIMMs	8MB
Four 1M SIMMs	Four 4M SIMMs	20MB
Four 4M SIMMs	x	16MB
Four 4M SIMMs	Four 4M SIMMs	32MB

RAM Bank	SIMM Socket
Bank 0	SIM 1, SIM2, SIM3, SIM4
Bank 1	SIM5, SIM8, SIM7, SIM6

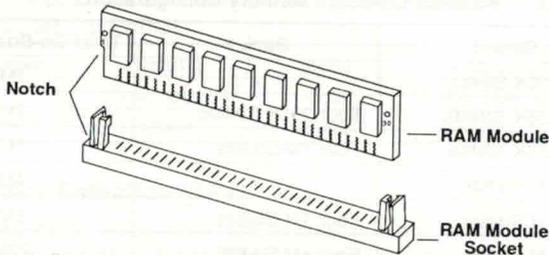
- Note:**
1. We recommend that you use 80ns DRAM.
 2. Note that if you install SIMM modules of different types, SIMM modules of the smaller size should be installed first. For example, if you wish to install 256K and 1M SIMM modules, 256K SIMM modules should be installed in Bank 0 and 1M SIMM modules in Bank 1.

III-2 Installing SIMM Modules

Follow the steps below to install a SIMM module:

- At a 70° to 80° angle, insert the SIMM module's edge connector ("golden fingers") into the SIMM socket. The component side (side with the memory chips) should face the stud and lip of the retainer. Because one end of the SIMM board is notched, the module can only be inserted in this way.
- Gently but firmly push the SIMM module against the retainer until the retainer studs on both ends slip into the module board holes. At the same time the locking tabs should slip around the side of the module letting the module snap into an upright position.
- Enter the setup program by pressing the key after power on self test. Verify the size of memory in the Standard CMOS Setup and write it to the CMOS memory.

Figure 3. Installing a SIMM Module



Note: *Even though the BIOS will automatically sense the DRAM installed on the mainboard, you still have to enter the Standard CMOS Setup to verify the size of memory and write it to the CMOS. If the memory size automatically detected is not correct, check if DRAM modules are firmly installed.*

III-3 Removing SIMM Modules

Follow the steps below to remove a SIMM module:

- Use both thumbs to carefully spread the locking tabs that hold the module in the upright position. The locking tabs must be pulled far enough away from the module so that the module can slip around the edge of the tabs.
- Pull the module away from the tabs. After the retainer studs slip out of the holes, the module will be at a 70° to 80° angle and can easily be lifted out of the socket.

Chapter IV

Setting Up the Cache Memory System

In addition to the 486 internal on-chip cache memory, your system was designed to support secondary cache. It supports on-board 64K, 128K or 256K bytes of cache memory. Cache of 64KB has a cacheable range of 16MB of memory, 128KB's range is 32MB, and 256KB's range is 64MB.

IV-1 Cache Memory Configurations

Table 4. Cache Memory Configurations

Cache Memory	Bank A (U31, U32, U33, U34)	Bank B (U22, U23, U24, U25)	Tag RAM (U26)
64K	Four 8Kx8	Four 8Kx8	One 8Kx8
128K	Four 32Kx8		One 8Kx8
128K	Four 32Kx8	Four 32Kx8	One 32Kx8

Table 5. SRAM Specification Double Banks (64K/256K)

System	Tag SRAM Speed (below)	Data SRAM Speed (below)
16MHz	35ns	35ns
20MHz	35ns	35ns
25MHz	25ns	30ns
33MHz	20ns	25ns

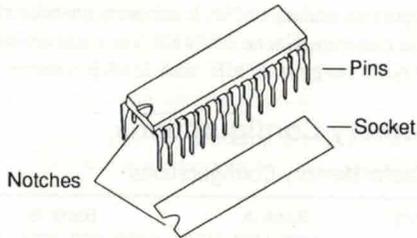
Table 6. SRAM Specification for Single Bank (128K)

System	Tag SRAM Speed (below)	Data SRAM Speed (below)
16MHz	35ns	35ns
20MHz	35ns	35ns
25MHz	30ns	25ns
33MHz	20ns	15ns

IV-2 Installing an SRAM

When you insert SRAM modules, you must make sure the dotted or notched end of the RAM module is lined up with the dotted or notched end of its socket. Gently push the module into the socket. Do not bend the pins. Refer to the figure below.

Figure 4. Installing SRAM



IV-3 Enable the Cache Memory in BIOS Setup

The Cache System can be activated or deactivated through the CMOS Setup in the Advanced CMOS Setup screen. *Chapter V* details the operation of CMOS Setup. To optimize system performance, make sure that both the internal and external cache memory are enabled.

Chapter V

CMOS RAM Setup

The system board contains user modifiable system configuration information in a CMOS RAM. This power conserving RAM is battery backed up so that it retains the configuration setup information even when the computer's power is switched off. Thus, when power is switched on, configuration information is immediately available to the BIOS and the operating system. The Setup program allows the user to change the configuration information stored in the CMOS RAM to match the configuration of the system.

There are two sets of values stored in the ROM file.

- The BIOS Setup default values
- The Power-On Default Values

The BIOS Setup Default Values are the safe settings which allow the system to operate normally.

The Power-On Default Values are the safest settings for the system. These settings are very useful to use if the system is performing erratically because of hardware problems.

V-1 Entering Setup by Pressing the Key

You may press the key after Power On Self Test to enter the BIOS Setup Utilities.

If any errors found by the BIOS are Non Fatal, then it may display:

Press <F1> to RESUME

Pressing the <F1> key will let the BIOS proceed by booting from a bootable device.

If any errors found by BIOS are Fatal Errors, then it will display:

RUN Setup UTILITY

Press <F1> to RESUME

Pressing <F1> key will let the BIOS enter the Setup Utilities in this case.

V-2 Hot Keys Used in CMOS Setup

The following keys are used for CMOS Setup Utilities:

	Enter the Setup program.
<Esc>	Exit to the previous menu.
<↑>, <↓>, <←> and <→>	Move cursor to the desired option.
<Enter>	Confirm the selection.
<PgUp> and <PgDn>	Modify the default values. Scroll allowable settings. (<Ctrl> <Page Up> and <Ctrl> <Page Down> function the same if there are less than 10 available options).
<F1>	Display help screen for selected feature.
<F2> and <F3>	Change background and foreground color.
<F5>	Retrieve old values which were resident when current setup was started.
<F6>	Load BIOS Setup defaults.
<F7>	Load Power-On defaults.
<F10>	Save all changes and exit.

V-3 Write to CMOS and Exit

After you have changed any values in Setup, you must enter the "WRITE TO CMOS AND EXIT" option to save the new settings. Until users save the changes to the CMOS, the BIOS will continue to use the old settings (even though the new settings appear in the Setup screen window displays).

You should do the following to save the new settings to the CMOS:

- Return to the main menu by pressing <Esc>.
- Press the <↑> and <↓> key to move the highlight bar to the "WRITE TO CMOS AND EXIT" option and press <Enter>.

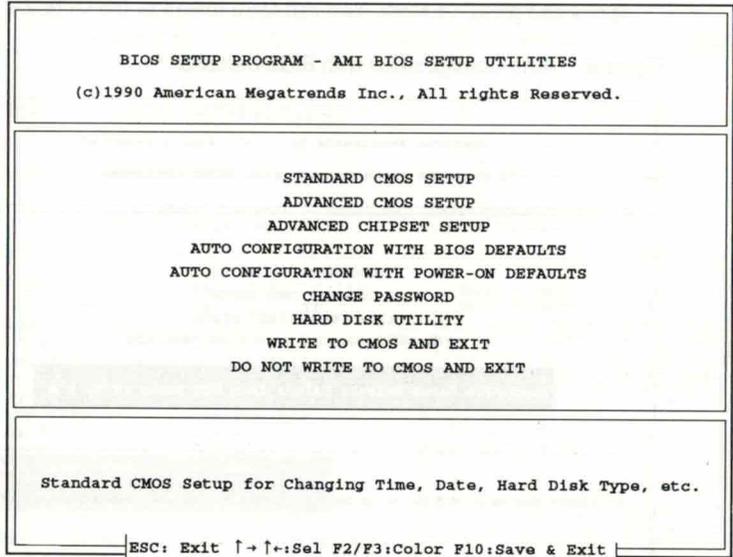
Do Not Write to CMOS and Exit

This option (in the Main menu) passes control back to BIOS without writing any changes to the CMOS.

V-4 AMI BIOS Setup Utilities (Main Menu)

If the or <F1> key is pressed after POST, you will see a screen which shows the AMI BIOS Setup Utilities:

Figure 5. AMI BIOS Setup Utilities (Main Menu)



The different options in the BIOS Setup program are shown in the figure above. Select "STANDARD CMOS SETUP" if you want to change the setting for time, date, hard disk type, display, etc.

V-5 Warning Messages

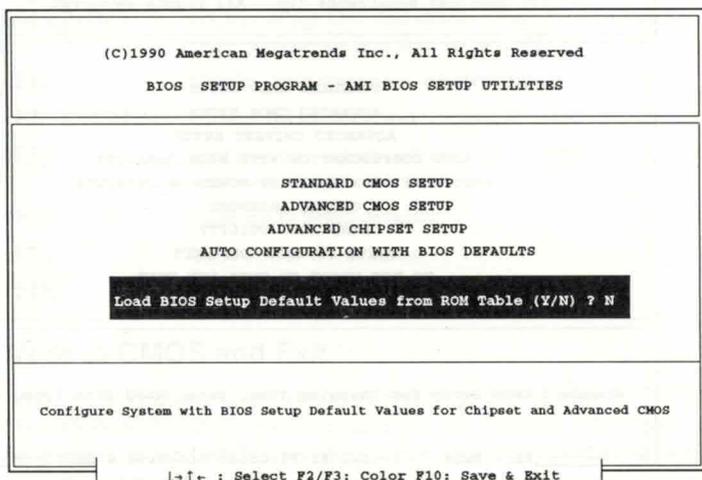
The user is given a warning message before he is allowed to change any of the Setup parameters of the first three options (Standard CMOS Setup, Advanced CMOS Setup, and Advanced Chipset Setup).

V-6 Auto Configuration with BIOS Defaults

The BIOS Setup Default Values are the system default values which are supposed to allow the system to function normally. If you wish to load the BIOS defaults, do the following.

- Enter the BIOS Setup Utilities.
- Highlight the "AUTO CONFIGURATION WITH BIOS DEFAULTS" option and press <Enter>. You will see a screen as shown below.

Figure 6. Auto Configuration with BIOS Defaults



- Change the prompt to <Y> and press <Enter>. The following message will appear on the screen:

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

V-7 Auto Configuration with Power-On Defaults

You may wish to use the Auto Configuration with Power-On Defaults as a diagnostic aid if your system is behaving erratically. If you wish to load the Power-On Defaults, do the following:

- Enter the BIOS Setup Utilities.
- Highlight bar to the "AUTO CONFIGURATION WITH POWER-ON DEFAULTS" option and press <Enter>.
- Change the prompt to <Y> and press <Enter>.

V-8 Standard CMOS Setup

The Standard CMOS Setup screen allows you to set up time, date, hard disk type and display. Follow the steps below to run the Standard CMOS Setup.

- Press the key immediately after you turn on your computer (or reset) to enter the BIOS Setup Utilities.
- The main menu will show the options. The "STANDARD CMOS SETUP" option is highlighted. Press <Enter> and you will see a warning screen. Pressing any key except <Esc> will allow you to enter the Standard CMOS Setup as shown below.

Figure 7. Standard CMOS Setup

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

Date (mm/date/year): Wed, July 10, 1991
 Time (hour/min/sec): 04 : 11 : 26
 Daylight saving : Disabled
 Hard disk C: type : 17
 Hard disk D: type : Not Installed
 Floppy drive A: : 1.2MB, 51/4"
 Floppy drive B: : Not Installed
 Primary display : VGA/PGA/EGA
 Keyboard : Installed

Base memory : 640 KB
 Ext. memory : 0 KB

Cyln	Head	WPcom	LZone	Sect	Size
977	5	300	977	17	41MB

Sun	Mon	Tue	Wed	Thu	Fri	Sat
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	7	8	9

Month : Jan, Feb, Dec
 Date : 01, 02, 03, 31
 Year : 1991, 1992, ... 2099

ESC:Exit I-↑:Select F2/F3:Color PU/PD:Modify

After you have entered the Standard CMOS Setup, you can modify each of the entries. Remember to return to the main menu and write the data to CMOS memory after you modify any setting.

The AMI Setup program provides an easy to operate screen menu guiding the user without any special operating knowledge. For example, to modify the "Hard disk C" entry you may press the <↑> and <↓> keys to move the highlight bar cursor to the "Hard disk C" entry. Pressing the <PageUp> and <Page Down> keys will let you select from the hard disk type options.

You can setup the following in the Standard CMOS Setup menu.

- **Date:** Month, Date and Year.
- **Time:** Hour, Minute and Second. Use 24 hour clock format.
- **Daylight Saving:** Disabled or Enabled
- **Hard Disk C And D:**

Forty-six drive types have been defined by AMI BIOS. If for some reason your particular drive is not one of the 46 pre-defined types, simply scroll down (using the <Page Up> or <Page Down> key) to type 47 and enter the following drive specifications:

Cylinders, Heads, WPcom, LZone, Sectors

Type 47 may be used for both hard disk C and D. Please consult your vendor for the specific values that will give you optimum performance. "Not Installed" is available for use as an option. This option could be used for diskless workstations and SCSI hard disks.

- **Floppy Drive A and B:**

360KB5 1/4"

1.2MB5 1/4"

720KB3 1/2"

1.44MB3 1/2"

Not installed

- **Primary Display:**

The primary display options are:

Monochrome

Color 40 x 25

Color 80 x 25

EGA/PGA/ VGA

Not installed

- **Keyboard:** Installed or not installed

After you have modified the configurations in the Standard CMOS Setup, press <Esc> to exit to the AMI BIOS Setup Utilities — the main menu which provides the "WRITE TO CMOS AND EXIT" option. Select this option and save all the changes to the CMOS.

V-9 Advanced CMOS Setup

The Advanced CMOS Setup is an advanced setup software design which gives flexibility and allows your system to run in different ways. Less experienced users may seek the advice of a technician or dealer before modifying the values of the Advanced CMOS Setup or load the BIOS default settings first and make modification from that point. The figure below shows the Advanced CMOS Setup screen.

Figure 8. Advanced CMOS Setup

BIOS SETUP PROGRAM - ADVANCED CMOS SETUP			
(C) 1990 American Megatrends Inc., All Rights Reserved			
Typematic Rate Programming	: Disabled	Video ROM Shadow C000, 32K:	Enabled
Typematic Rate Delay (msec)	: 500	Adapter ROM Shadow C800, 32K:	Disabled
Typematic Rate (Chars/Sec)	: 15	Adapter ROM Shadow D000, 32K:	Disabled
Above 1MB Memory Test	: Disabled	Adapter ROM Shadow D800, 32K:	Disabled
Memory Test Tick Sound	: Enabled	Adapter ROM Shadow E000, 32K:	Disabled
Memory Parity Error Check	: Enabled	Adapter ROM Shadow E800, 32K:	Disabled
Hit Message Display	: Enabled	System ROM Shadow F000, 64K:	Enabled
Hard Disk Type 47 Data Area	: 0:300		
Wait for <F1> If Any Error	: Enabled		
System Boot Up Num Lock	: On		
Weitek Processor	: Absent		
Floppy Drive Seek At Boot	: Disabled		
System Boot Up Sequence	: C:, A:		
Cache Memory	: Enabled		
Internal Cache Memory	: Enabled		
Fast Gate A20 Option	: Disabled		
Turbo Switch Function	: Enabled		
Password Checking Option	: Disabled		
ESC: Exit ↓↑←:Sel (Ctrl) Pu/Pd:Modify F1: help F2/F3: Color F5: Old Values F6: BIOS Setup Defaults F7: Power-On Defaults			

The Advanced CMOS Setup program is equipped with a series of **Help** screens, accessed by the <F1> key, which will display the options available for a particular configuration feature and special help for some of the options.

Note: Users must enter the "WRITE TO CMOS AND EXIT" to save the new settings or the BIOS will continue to use the old values.

You can set up the following in the Advanced CMOS Setup menu.

- **Typematic Rate Programming: Enabled or Disabled**
By enabling this option, the user can adjust the rate at which a keystroke is repeated. The options "Typematic Rate Delay" and "Typematic Rate" affect this rate. When a key is pressed and held down, the character appears on the screen and after a delay set by the "Typematic Rate Delay," it keeps on repeating at a rate set by the "Typematic Rate" value. The suggested setting for the "Typematic Rate" and "Typematic Rate Delay" are shown in the screen on the previous page.
- **Typematic Rate Delay (msec):** See above
- **Typematic Rate (Chars/Sec):** See above
- **Above 1MB Memory Test: Enabled or Disabled**
If this feature is disabled, the BIOS will only test the first 1MB of RAM.
- **Memory Test Tick Sound: Enabled or Disabled**
This option will enable or disable the "ticking" sound during the memory test.
- **Memory Parity Error Check: Enabled or Disabled**
If your DRAM module include the parity RAM, users may enable the memory parity error checking routines in the BIOS.
- **Hit <Esc> Message Display: Enabled or Disabled**
Disabling this option will prevent the message "Hit <Esc> if you want to run Setup" from appearing on the screen when the system boots up.
- **Hard Disk Type 47 Data Area: 0:300**
The AMI BIOS Setup features two user-definable hard disk type. 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 1KB," the DOS Shell is shortened to 639KB, and the top 1KB is used for the hard disk data storage.
- **Wait for <F1> If Any Error: Enabled or Disabled**
If this option is disabled, any non-fatal error which occurs will not generate the "Press <F1> to continue" statement. The BIOS will still display the appropriate error message. This eliminates the need for any user response to a non-fatal error condition message.

- **System Boot Up Num Lock: On or Off**
 The user may turn "OFF" the Num Lock option on the user's enhanced keyboard when the system is powered on. This will allow the user to use the arrow keys on the numeric keypad. The default setting is "ON".
- **Weitek Coprocessor: Absent or Present**
 This option allows the user to mark the numeric Weitek coprocessor as present or absent.
- **Floppy Drive Seek at Boot: Enabled or Disabled**
 You may set this option as "Disabled" to allow a fast boot and to decrease the possibility of damage to the heads.
- **System Boot Up Sequence: A:, C: or C:, A:**
 You may set the boot up sequence as A:, C: (normal) or as C:, A:.
- **Cache Memory: Enabled or Disabled**
 Enable or disable the on-chip internal cache.
- **External Cache Memory: Enabled or Disabled**
 With this option, the user may specify whether the external cache is present or absent.
- **Fast Gate A20: Enabled or Disabled**
 This option provides a faster option to control the Gate A20 for OS/2 optimization.
- **Turbo Switch Function: Enabled or Disabled**
 Users may enable or disable the turbo switch with this option.
- **Password Checking Option: Disabled, Setup, or Always**
 You may setup the password in different ways. The password may be asked either in every boot, for entering into the setup program, or never. The default setting is disabled. If you wish to set up your password, set this feature as "Setup" or "Always" and then go to the "Change Password" screen and change the default password "AMI" to the desired password. See *V-12 Change Password*.
- **Video ROM Shadow, Adapter ROM Shadow: Enabled or Disabled**
 ROM shadow is a procedure in which BIOS code is copied from slower ROM to faster RAM. The BIOS is then execute from the RAM. These option areas are chipset specific and are dependant on the system hardware. We recommend that you use the BIOS Default settings. Each option, when enabled, allows for a segment of 32KB to be shadowed from ROM to RAM.
- **System ROM Shadow: Enabled or Disabled**
 The same concept applies here as above, except that in this case, the system BIOS (64KB in length) is shadowed.

V-10 Advanced Chipset Setup

The Advanced Chipset Setup is an advanced setup software design which replaces most hardware jumper settings and allows greater control over function settings, including clock selection, wait state setting, etc.

This option is used to change the register values for the chipset registers. These registers control most of the system options in the computer.

This utility programs the Chipset with user defined values, which will be used by the BIOS to program the Chipset registers during system booting. If this utility is not run, then the BIOS will supply the BIOS Default values for the Chipset registers.

Note: *This is a very powerful utility and less experienced users should seek the advice of a technician or dealer before modifying the values of the Advanced Chipset Setup.*

Follow the steps below to run the Advanced Chipset Setup:

- Enter the BIOS Setup Utilities.
- Press the <↑> and <↓> key to move the highlight bar to the "ADVANCED CHIPSET SETUP" option and press <Enter>.

Figure 9. Advanced Chipset Setup

BIOS SETUP PROGRAM - ADVANCED CHIPSET SETUP (C)1990 American Megatrends Inc., All Right Reserved	
<pre> AT-BUS Speed : CPUCLK/4 I/O Cmd Recovery Control : Disabled External Cache Installed : Yes Cache Read Wait State : 1 Shadow RAM Cacheable : No Remapped Memory Cacheable : Yes Local Memory Access, Block-1: Yes Block-1 Memory Size : 256KB Block-1 Memory Base Address : 1024KB Block-1 Memory Cacheable : Yes Block-2 Memory Size : 256KB Block-2 Memory Base Address : 768KB Block-2 Memory Cacheable : Yes DRAM RAS Precharge Time : 0 </pre>	
ESC: Exit ↓+←:Sel (Ctrl) Pu/Pd:Modify F1: help F2/F3: Color F5: Old Values F6: BIOS Setup Defaults F7: Power-On Defaults	

The following are descriptions for the Advanced Chipset Setup.

■ **AT-BUS Speed:**

To maintain full compatibility with the ISA 8MHz specification, setup the bus clock as below:

1. Set AT bus clock as $CPUCLK/4 = 33/4$ for a 33MHz system.
2. Set AT bus clock as $CPUCLK/3 = 25/3$ for a 25MHz system.
3. Set AT bus clock as $CPUCLK/2 = 20/2$ and enable the I/O command Recovery Control for a 20MHz system.

You may also set the AT-BUS Speed as $CPUCLK/3$ for a 20MHz system.

4. Set AT bus clock as $CPUCLK/2 = 16/2$ for a 16MHz system

■ **I/O Cmd Recovery Control:** Disabled or Enabled

When this function is enabled, the system ensures a minimum of 7 bus clock cycles between the commence of any two back-to-back I/O commands. The default setting is Disabled.

■ **External Cache Installed:** Yes, or No

This function is used to set up the external cache memory.

■ **Cache Read Wait State:** 1 or 0

"1" means cache read hit 1WS (i.e. 3-1-1-1). "0" means cache read hit 0WS (i.e. 2-1-1-1).

■ **Shadow RAM Cacheable:** Yes or No

This indicates if the shadow RAM area from C8000h to EFFFFh is cacheable or non-cacheable.

■ **Remapped Memory Cacheable:** Yes or No

This function determines whether the remapped memory is cacheable. If you use the remapped memory as Lan buffer, set this block as non-cacheable. The followings are the description about the memory remapped in your system.

- 1) Your system board supports 256K memory remap.
- 2) The unused A000, B000, D000 segments can be remapped to top of the on-board memory, thereby gaining 256KB of memory.
- 3) If any 32K block within the D000 and E000 segment is shadowed, only A000 and B000 segments will be remapped. In this case, the total remapped memory size is 128K.
- 4) Memory remap only occurs on systems with 12MB or less local memory.

- **Local Memory Access, Block-1:** Yes or No
This function is used to define whether memory block 1 is local memory access or non local memory access (access to AT bus). The default setting is "Yes" for local memory access. For special applications (for example, high resolution graphic card), you may set up block 1 as non-local (AT bus access).

- **Block-1 Memory Size:** 256KB, 512KB, 1MB, 2MB
This determines the size of memory block-1.

- **Block-1 Memory Base Address:**
The Block-1 Base must be a multiple of the block 1 size. See the table below:

Block Size	Lowest Base Address
256KB	1024KB
512KB	1024KB
1MB	1024KB
2MB	2048KB

- **Block-1 Memory Cacheable:** Yes or No
This determine whether block-1 is cacheable.
- **Block-2 Memory Size:** 256KB, 512KB, 1MB, 2MB
This determines the size of memory block-2.
- **Block-2 Memory Base Address:**
The Block-2 Base must be a multiple of the block-2 size.
- **Block-2 Memory Cacheable:** Yes or No
This determines whether block-2 is cacheable.
- **DRAM RAS Precharge Time:** 0 or 1
This determines the DRAM RAS precharge time. "0" means 2.5 T-cycles and "1" means 3.5 T-cycles

V-11 Hard Disk Utilities

The AMI BIOS also supports Hard Disk Utilities. The various sub-options are:

- **Hard Disk Format:** The Hard Disk Format utility is used for performing a "low level" format of the hard disk. The disk drive information is taken from the Standard CMOS Setup. If the user wants to change the disk drive types, he must go to the Standard CMOS Setup and change it. The user is asked for the disk drive (C/D) if two disks have been installed.
- **Auto Interleave:** For automatically detecting the best interleave factor and formatting the hard disk. The user can enter the bad track list.
- **Media Analysis:** This option performs an analysis of each track of the hard drive to determine whether it is usable. If it is not usable, the track is marked as "bad" so that data cannot be stored there in the future.

Pressing the key after power on will allow you to enter the Setup Utilities. Highlight the Hard Disk Utility and press <Enter>. You will see a screen as shown below.

Figure 10. Hard Disk Utility

Note: *These routines are not valid for a SCSI Disk Drive.*

BIOS SETUP PROGRAM - HARD DISK UTILITY (C)1990 American Megatrends Inc., All Rights Reserved	
Hard Disk C: Type : 17	Cyl'n Head W'poom Lzone Sect Size (MB)
Hard Disk D: Type : Not Installed	977 5 300 977 17 41
Hard Disk Type can be changed from the STANDARD CMOS SETUP option in Main Menu	
Hard Disk Format Auto Interleave Media Analysis	
ESC: EXIT ↓→←: Sel F2/F3: Color	

WARNING

Performing the Hard Disk Format, Auto Interleave, and/or Media Analysis will destroy any data on the hard disk being tested. Backup your files before performing any of these utilities.

V-12 Change Password

The Change Password option is used to change the password of the system. The password can be at most 6 characters long. The password is stored in the CMOS. There is a default password ("AMI") stored in the ROM. To change the password, follow the steps below:

- Press the key after power on to enter the BIOS Setup Utilities.
- Enter the Advanced CMOS Setup and set the "Password Checking Option" as "Setup" or "Always". See the Advanced CMOS Setup section.
- Highlight the Change Password option and press <Enter>. You will see a screen as shown below.

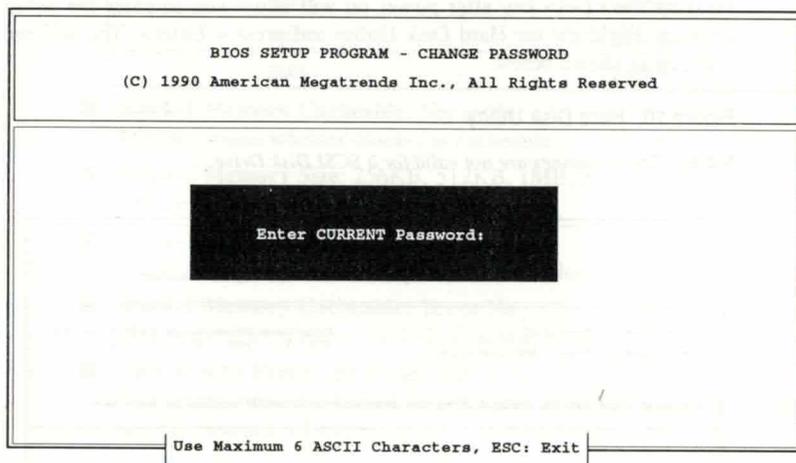


Figure 11. Change Password Screen

- You will be asked for the "CURRENT" password before you can change the password. Type the default password "AMI" when you first try to set up your password. Type your current password if you want to change your password.
- After you have entered the correct "CURRENT" password, you will be asked for the "NEW" password. You may key in the new password desired. Remember that the password can be 6 characters long at most.

Chapter VI

Q & A for Servicing your System

Q: *Why does my system not work?*

A: It is important to note that problems on a new system should be treated differently than problems on a system that has been working for a period of time and suddenly has trouble.

In particular, if a previously working system suddenly fails, the first thing to check is the most recent hardware or software upgrade to system. Installing new programs or system equipment can sometimes result in subtle changes to the way a system operates and affect system operation. Always try backing out of the upgrade, that is, reinstalling the new hardware or software to see if the problem goes away. If this is the case, review the installation steps taken and contact the supplier of the new equipment or software for help in installing their products.

A newly setup system may have the following problems, please check and restore:

- Power cord is not plugged. Check if the power-on LED lights up.
- Monitor cable is not attached.
- Keylock is engaged; release it now.
- Connectors are not firmly installed, or installed in the wrong position. Remember do not connect the Turbo-Switch wire to the reset connector!
- Add-on card is not installed firmly.
- You may have incorrectly set the jumpers.
- Besides signal cables, the FDD and HDD should also be attached with power line from the power supply.
- Floppy diskette or hard disk is not formatted, or formatted without bootable system.
- Wrong configuration setup for CMOS RAM.
- Peripherals are not compatible.

Q: *My system has no display, or the "Display Type Mismatch" message is on the screen.*

A: First, try to turn the brightness and contrast controls to proper ranges, and make sure the video signal cable is securely connected. If the system still can't display, check the switch or jumper settings on the mainboard and video adapter card. The following table details the settings:

Mode	Adapter you may Install
Mono	Monochrome Card or Hercules Card
Color	CGA, EGA, VGA or EVGA

Q: *Why does my system always show less memory for the Power On Self Test?*

A: The memory reserved for the system (from 640 to 1024) is not displayed on the screen.

Q: *Why does an add-on card from my old computer not work properly in this system?*

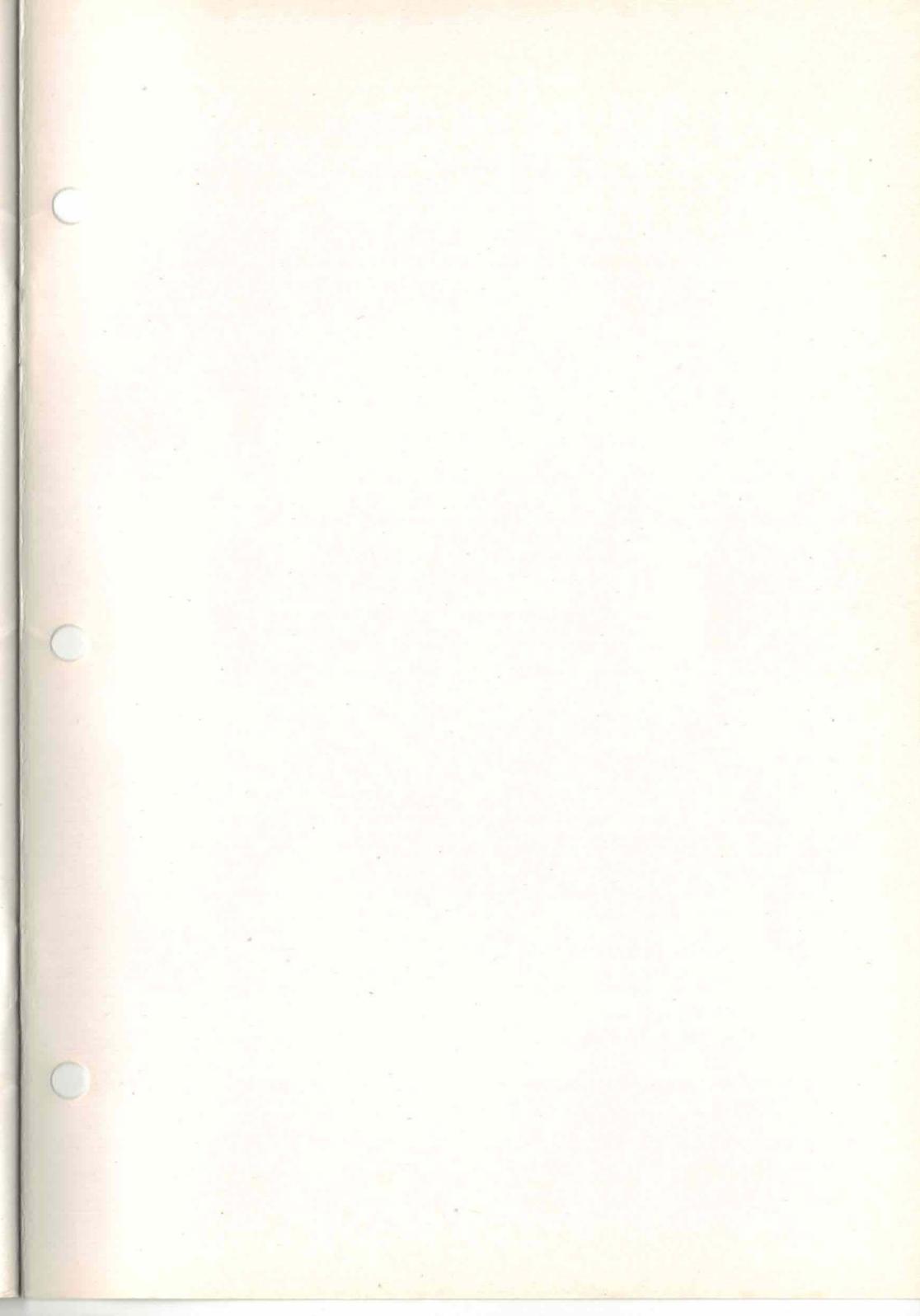
A: Check the switch and jumper settings on both the add-on card and the mainboard. There may be an address or interrupt conflict. You may have a compatibility problem, as some add-on cards were designed to run at slower processor clock speeds.

Q: *Why doesn't my keyboard respond?*

A: Check if the Keylock Switch of the front panel is turned to the unlock position. You may have an XT/AT compatible keyboard, set the switch to the AT-position. Some keyboards will enable the NumLock function when the system is booted, press the key to disable NumLock function if necessary. Please verify for the LED on the keyboard, the LED will light up and turns off during Power On Self Test. If it does not light up, check if the Keyboard Connector is connected firmly.

Q: *Why does my FDD or HDD not work?*

A: You may have attached a new floppy or hard disk drive to your system. Please verify that the CMOS RAM Configuration matched with the types of your FDD/HDD. Please check if you have a scratched diskette, change to a new workable diskette. Check if your HDD is formatted. Reset the system and verify that the LED on the FDD lights up briefly during Power On Self Test, and check the connection cables.



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