MYLEX

MVE486 System Board

Installation and Operations Guide

P/N: 771917-D01
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PREFACE

Thank you for your choice of a Mylex MVE486 System Board product. With proper installation and care, your Mylex System Board will operate for years without any service requirement. This Installation and Operation Guide will guide you in the installation process. The information contained herein is subject to change without notice.

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2) this device must accept any interference received, including interference that may cause undesired operation.

This equipment has been designed to provide reasonable protection against harmful interference in a residential area. This equipment generates, uses and can radiate radio frequency energy. This device, if not installed and used in accordance with the manufacturer's instructions, may cause harmful interference to radio communications. There is no guarantee, however, interference will not occur in a particular installation. Should it be determined that this equipment is causing interference to radio or television reception, the following suggested actions may be taken.

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2) Each returned unit will be inspected for damage or other irregularities. If a unit is shown to be modified, the customer will be notified before any action is taken.

3) Mylex will not be responsible for non-Mylex products shipped with an RMA unit. This includes memory, math co-processors and other internal and external peripherals.

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Introduction

Thank you for making the decision to purchase the Mylex MVE486. With proper installation and maintenance, the MVE486 will provide years of trouble-free operation.

Package Contents

- MVE486 System Board
- Cable Kit (2 serial cables and 1 parallel cable)
- EISA Configuration Utility diskettes
- This manual
- EISA Configuration Utility User's Guide
- Warranty Card
- Any pertinent release notes available at the time of shipment.
- System Problem Report Form

Handling Precautions

The MVE486 contains electronic components that are highly sensitive to electrostatic discharge. Use extra caution when handling the MVE486 to ensure there is adequate grounding around the work area the board is being installed. ALWAYS wear a ground strap or ground your body by touching a grounded object such as an un-painted metal device connected to power ground.

The MVE486 has delicate crystal oscillators that can break if subjected to sudden shock such as being tossed on a table. Use care when moving the MVE486 from point to point.

If Troubles Are Encountered

If, during the course of installation or operation of the MVE486, the board displays improper operation, first consult this manual's Troubleshooting section, paying particular attention to the jumper settings, as well as the BIOS section of this manual. Then contact your dealer or distributor for additional information. Dealers and Distributors may contact Mylex Technical Support Department at (510) 796-6100. Be sure to have the enclosed System Problem Report completely filled out.

Overview

General Description: The MVE486 is a Baby AT form factor EISA-VESA system board based upon the Intel 80486 series CPU. The highly integrated ASIC design provides high performance coupled with a long list of features including: 4 bus master EISA slots, 2 EISA-VL (VESA) bus master slots, 486SX, 486DX, 486DX2 and future upgrade processor support, up to 256KB of direct-map adaptive write-back cache, up to 128MB of DRAM, integrated I/O for serial, parallel, IDE and high speed floppy drive control, FLASH ROM BIOS, ZIF (Zero Insertion Force) CPU socket and frequency synthesizer. A brief description of major feature follows:

EISA BUS Architecture: EISA has emerged as the defacto standard for a 32-bit PC BUS. Backward compatible with the original AT BUS, as well as providing the highest performance available from a PC standard bus - 33 MB/sec -, EISA is the architecture of choice, All slots on the MVE486 are "Bus Master" and "Burst Mode" compatible ensuring EISA adapter compatibility.

VESA Bus Architecture: VESA emerged as the defacto standard local bus for PC systems. VESA-VL bus works at CPU clock, so the highest data transfer rates can be achieved. MVE486 supports two VESA slots up to speeds of 33MHz. Both the slots are bus master, non-DMA slots.

Upgradable CPU: The MVE486 includes a special ZIF (Zero Insertion Force) socket that allows easy processor changes. The MVE will handle the full spectrum of the i486 series of processors from the Intel486™ SX-20 through the 80486DX-50 as well as the available speeds of the 486DX2s and the new OverDrive™ processors. Installation of a processor is easy with the special ZIF (Zero Insertion Force) socket; simply lift the tension lever, remove the old CPU and drop in the new processor. There are no special tools required. A series of jumpers are clearly marked to select the processor type.

2-128MB of DRAM Memory: While most system boards only support 32 or 64MB, the MVE486 quadruples that memory capacity up to 128MB. This is a must for network file servers and multi-user, time-sharing systems. The MVE486 supports the new 72 pin standard single as well as double sided modules of 512x36, 1 Mx36, 2Mx36, 4Mx36, 8Mx36.

64-256K of Adaptive Write-Back Cache Memory: Cache memory is an essential part of maintaining high system performance. In most cases, the larger the cache memory, the greater the system performance. Repetitive programs such as spread-sheet and CAD applications will benefit the most. The standard configuration includes 128K of cache memory. For 64K cache memory you need 8 pieces of 8Kx8 - 20NS chips. To upgrade to 256K, you may need 8 pieces of 32Kx8 - 20NS SRAM chips with one additional 8Kx8 - 15NS Tag RAM.

Unlike other cache architectures that require the CPU to write directly to DRAM, (usually 3 wait states or more) the write-back cache is the most efficient way for cache to write information back to main memory. This is because the cache can be written to within a Zero Waitstate cycle. Then the cache circuit writes the information to the DRAM by itself.

Embedded I/O: The MVE486 includes the latest generation of Super I/O controllers which provides 2 serial ports, a parallel port, IDE disk interface and floppy disk controller. The floppy disk controller is capable of supporting the new "4MB" floppy disk drives. Just as important, the floppy controller is capable of data rates of 1 MB/sec--this is a significant benefit in performance on various floppy tape drives compatible with the 1MB/sec transfer rates. In addition, the serial port UARTS are compatible with the National" 16450 with 16-byte FIFO.

OPTIONAL FLASH ROM BIOS: At one time or another, the need can arise to update the system BIOS. Usually this means that the system must be partially disassembled, the old ROM chip removed, discarded, the new ROM chip installed and the system reassembled. With FLASH technology, BIOS updates are

made simply by running a program. With the MVE486 there are no chassis to open, no jumpers to set. Simply run a DOS program that reads a BIOS .BIN file and then programs the new BIOS into the FLASH memory chip. **Note:** This is an option, that depending upon your source, a FLASH BIOS may or may not be installed. To determine whether a FLASH BIOS is installed, examine location U67 on the left hand lower edge of the board. If installed device occupies all available pins of the socket, it is a FLASH part. If two rows of pins are empty, then the MVE486 is equipped with a standard EPROM BIOS.

Frequency Synthesizer: Selecting a processor speed is as simple as setting a couple of jumpers. There are no oscillators to purchase, no components to desolder and resolder. The clear benefit of this feature is the ability to select whatever processor speed desired. However, DX2 or OverDrive processors (known as clock doublers), with a maximum input clock frequency of 33-MHz may be run on any standard board.

Contents: Section 1

This section is broken down into 6 major chapters. The following is a description of each chapter.

Chapter 1: Installation — This describes the major steps for installing the MVE486 into a chassis and making all necessary hardware connections including I/O cables.

Chapter 2: Troubleshooting — This section provides hints on resolving technical problems with the MVE486 system board.

Chapter 3: Upgrading — This section describes the steps necessary to upgrade the CPU and cache on the MVE486.

Chapter 4: Technical Reference: — This section covers some of the major aspects of the MVE486's design, as well as pin assignments and compatibility and benchmark information.

Appendix A: System Planning Worksheet

Appendix B: Upgrade Order information

Contents: Section 2

This section covers the Myiex BIOS installed on your MVE486. it is broken down into five chapters.

Chapter 1: BIOS Overview — provides an overview of the Mylex system BIOS and describes its features.

Chapter 2: BIOS Setup — describes how to use the setup program to configure your system board.

Chapter 3: BIOS Diagnostics — describes how to diagnose common problems you may have when setting up your system.

Appendix A: Error Messages

Appendix B: CMOS Hard Drive Table

What You Will Need

Before you begin to install the MVE486 in a chassis, the following tools will be required: A Phillips and fiat blade screwdriver, plastic stand-offs (these are normally supplied with the chassis) and assorted screws.

A good working knowledge of computers is highly recommended for installing a system board. It is not advised that a novice attempt installation of the MVE486.

Chapter 1: Installation

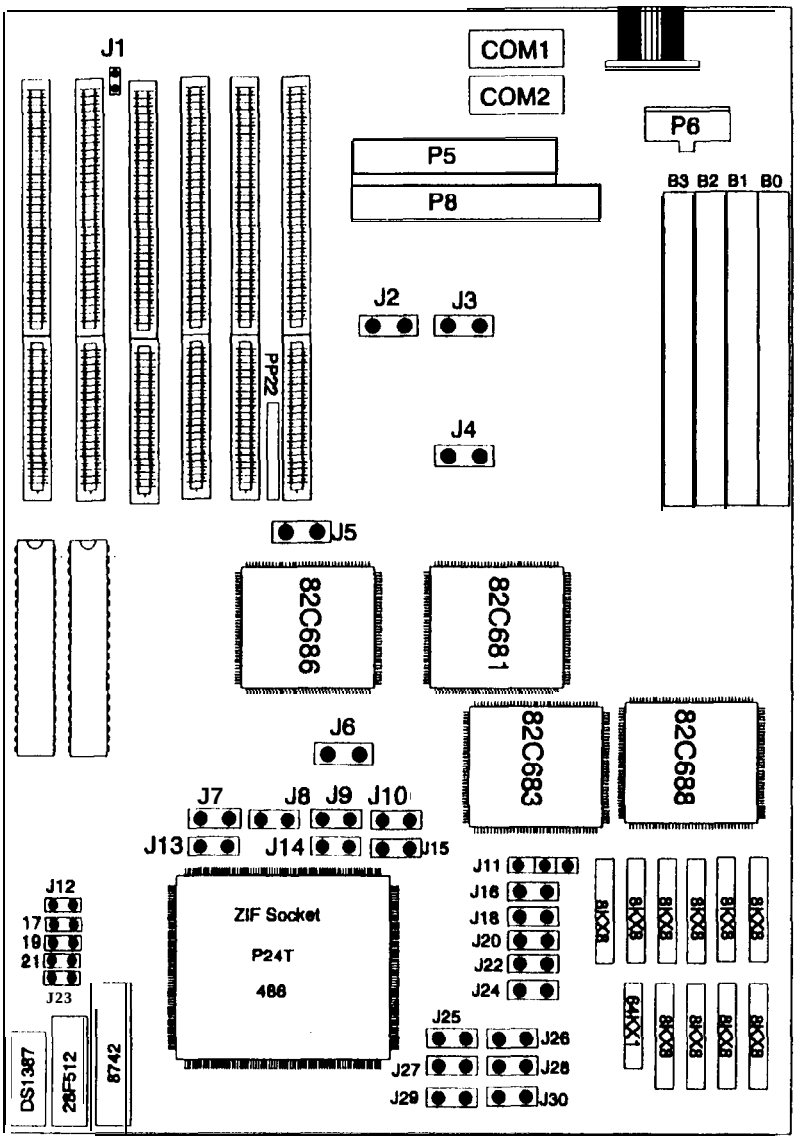

Figure 1-1: MVE486 System Board

A Quick Look At Jumper Settings

DEFAULT SETTINGS	
J4	OPEN
J30	OPEN
J2	2-3 CLOSE
J3	1-2 CLOSE
J8	CLOSE
J1	OPEN
J16	CLOSE

CPU TYPE		
J7	J13	CPUs
1-2 CLOSE/3-4 CLOSE	2-3 CLOSE	486DX/486DX2
1-2 CLOSE/3-4 CLOSE	1-2 CLOSE	487SX
2-3 CLOSE	OPEN	486SX

CPU SPEED

EBC SETTING			CLOCK	AVASEM SETTING			SPEEC
J5	J28	J26	J6	J27	J29	J25	
I-2	OPEN	OPEN	I-2	CLOSE	OPEN	OPEN	20MHz
2-3	OPEN	OPEN	I-2	OPEN	CLOSE	CLOSE	25MHz DX25/ DX2-5(
2-3	OPEN	CLOSE	1-2	OPEN	CLOSE	OPEN	33MHz DX33/ DX2-6(

CACHE SETTINGS

J11	J20	J18	J24	J22	U56	u57
2-3 CLOSE	OPEN	OPEN	OPEN	OPEN	N/A	8Kx8 15NS - 64K CACHE
I-2 CLOSE	CLOSE	OPEN	CLOSE	OPEN	N/A	8Kx8 15NS - 128K CACHE
2-3 CLOSE	CLOSE	CLOSE	CLOSE	CLOSE	8Kx8 15NS	8Kx8 15NS - 256K CACHE

Note: BANK0 = U70, U69, U59 and U58 and BANK1 = U72, U71, U61 and U60.

LOCAL BUS ENABLE JUMPERS

	DISABLE	ENABLE
J14-BRDY	1-2	2-3
J9-EADS	1-2	2-3

J15-HOLD	1-2	2-3
J10-HLDA	1-2	2-3

Installation

There are 5 easy steps for installing the MVE486 system board into a chassis.

1. Planning the system configuration.
2. Installing SIMM memory.
3. Changing any of the hardware jumpers, if the system configuration requires them to be changed.
4. Installing the board into the chassis.
5. Powering-up the system and setting the CMOS configuration information.

Planning the System

Using the simple form located in Appendix A, the resources available can be planned and any problems such as hardware conflicts can be avoided ahead of time. It would be a good idea to complete this form before system assembly is performed.

Installing Memory

The MVE486 provides four 72-pin SIMM sockets capable of taking single as well as double sided SIMMs. The MVE486 supports different SIMM sizes. All SIMMs should be 60 or 70 NS SIMMs. Please see the following table for the possible configurations.

Please note that the shaded areas of the table indicate tested combinations. Other combinations are not tested but are guaranteed to work.

SUPPORT OF SIMM MEMORY				
BANK 0	BANK 1	BANK 2	BANK 3	TOTAL
512K X 36				2M (default)
512K X 36	512K X 36			4M
1M X 36				4M
512K X 36	1M X 36			6M
1M X 36	1M X 36			8M
2M X 36	2M X 36			16M
512K X 36	2M X 36			10M
1M X 36	2M X 36			12M
2M X 36	2M X 36			16M
4M X 36				16M
4M X 36	4M X 36			32M
8M X 36				32M
8M X 36	8M X 36			64M
512K X 36	512K X 36	2M X 36		12M
512K X 36	512K X 36	2M X 36	2M X 36	20M
512K X 36	1M X 36	2M X 36		14M
512K X 36	1M X 36	2M X 36	2M X 36	22M
1M X 36	1M X 36	2M X 36		16M
1M X 36	1M X 36	2M X 36	2M X 36	24M

512K X 36	2M X 36	2M X 36		18M
512K X 36	2M X 36	2M X 36	2M X 36	26M
1M X 36	2M X 36	2M X 36		20M
1M X 36	2M X 36	2M X 36	2M X 36	28M
2M X 36	2M X 36	2M X 36		24M
2M X 36	2M X 36	2M X 36	2M X 36	32M
1M X 36	1M X 36	4M X 36		24M
1M X 36	IMX36	4M X 36	4M X 36	40M
2M X 36	2M X 36	4M X 36		32M
2M X 36	2M X 36	4M X 36	4M X 36	48M
4M X 36	4M X 36	4M X 36		48M
4M X 36	4M X 36	4M X 36	4M X 36	64M
1M X 36	1M X 36	8M X 36		40M
1M X 36	1M X 36	8M X 36	8M X 36	72M
2M X 36	2M X 36	8M X 36		48M
2M X 36	2M X 36	8M X 36	8M X 36	80M
4M X 36	4M X 36	8M X 36		64M
4M X 36	4M X 36	8M X 36	8M X 36	96M
8M X 36	8M X 36	8M X 36		96M
8M X 36	8M X 36	8M X 36	8M X 36	128M
512K X 36	512K X 36	512K X 36		6M
512K X 36	512K X 36	512K X 36	512K X 36	8M
1M X 36	1M X 36	1M X 36		12M

1M X 36	1M X 36	1M X 36	1M X 36	16M

Installing the SIMM Memory

While installing the SIMM, the Pin ledge of the SIMM should be towards the Pin 1 side of the SIMM socket on the motherboard. The SIMM layout of the motherboard is as follows:

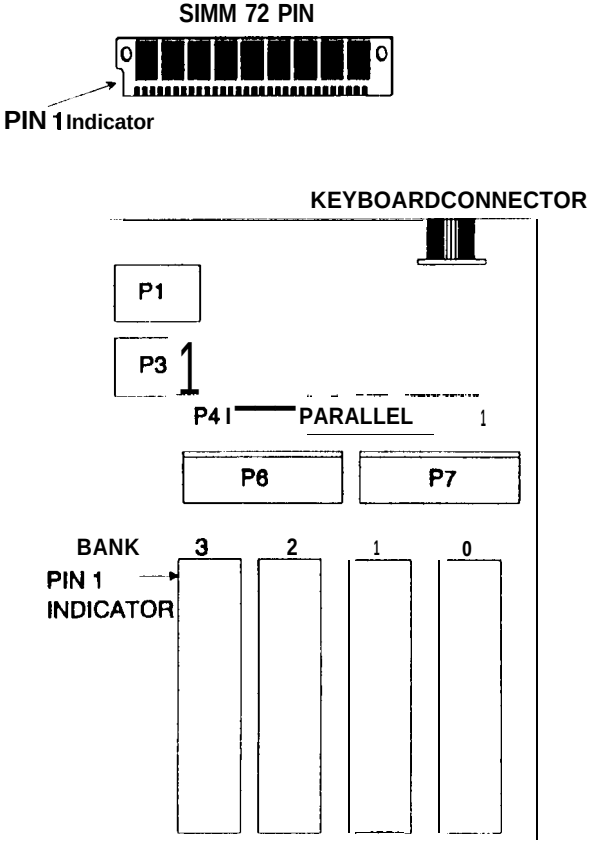

Figure 1-2 : MVE SIMM Installation

Installing or Upgrading the CPU

The MVE486 is equipped with a special ZIF (Zero Insertion Force) upgrade socket. This socket allows the system board to be installed with, or upgraded to a wide variety of processors. The standard MVE486 is designed, and is capable of running these types of processors:

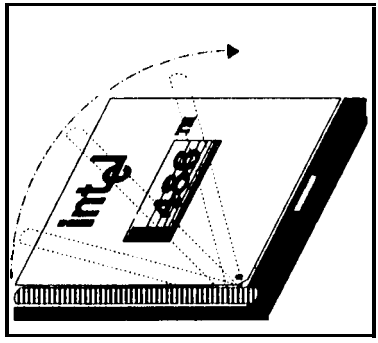

Figure 13: ZIF Socket

80486SX 20, 25, 33-MHz
80486DX 2533
80486DX2 50, 66-MHz
OverDrive 50-MHz

Once the processor that will be installed has been obtained, follow these simple steps.

1. Lift the lever on the upgrade socket.
2. Locate the pin 1 indicator on the 486 or OverDrive processor chip. This is usually indicated by a small black dot or a diagonal notch on one corner of the chip. See figure I-3.
3. Place the chip into position so that the pin one indicator is properly aligned with socket. See figure I-3.
4. Once pin 1 orientation is confirmed, close the lever.
5. Use the following two tables to set the processor type and speed.

PROCESSOR TYPE		
	J7	J13
486SX	2-3	OPEN
486DX, DX2	1-2, 3-4	2-3
487SX, OverDrive	1-2, 3-4	1-2

Note: *Jumper J7 is a four position jumper. For 487SX, Overdrive, DX and DX2, there are two jumpers, one over pins* **1 and 2 and the other covering pins 2** *and 3. If a 486SX processor is installed, only a single jumper is used covering pins* **2** *and 3.*

PROCESSOR SPEED				
	20-MHz	25-MHz	33-MHz	50-MHz*
J28	OPEN	OPEN	OPEN	CLOSE
J26	OPEN	CLOSE	CLOSE	CLOSE
J6	I-2	1-2	1-2	2-3
J27	CLOSE	OPEN	OPEN	OPEN
J29	OPEN	CLOSE	CLOSE	CLOSE
J25	OPEN	CLOSE	OPEN	CLOSE
J5	I-2	2-3	2-3	2-3

*** @ 50MHz disable the Local Bus.**

Color or Mono Video Selection

Jumper P1, located in the lower left corner of the board, is used set the type of video adapter. Placed over the two pins (closed), indicates a color video adapter is installed. Removed (open), indicates a monochrome adapter is installed. If both a color and mono adapter are installed, place the jumper in the position to indicate which video adapter will be used during boot-up.

Local Bus Jumper Settings

The following table details the Local Bus enable and disable jumpers.

JUMPER	ENABLE	DISABLE
J9	2-3	1-2
J10	2-3	1-2
J14	2-3	1-2
J15	2-3	1-2

The following Local Bus adapters have been tested and are recommended:

Video Cards	SCSI Ride Controller
Eagle Mountain S3 card	Alpha Research Corporation - DC-680 IDE caching controller
Stealth Diamond S3 card	Ultrastor SCSI controller
AIR S3 card/UTD S3 card	Promise IDE controller
Weitek Power 9000	

Chassis Installation

The MVE486 is designed to fit both “Baby AT” and “Full AT’ style chassis. While both these styles of chassis are generally recognized throughout the system board and chassis industry, some chassis may have slightly off-set dimensions due to manufacturing tolerances or design implementation. Therefore, it is suggested that before the system board is physically installed, the board be put into place to assure proper fit. Note the locations where screws can be installed and where the nylon stand-offs can be used. For proper grounding, at least 2 screws should be used to lock the system down. See figure l-4. These two locations are the most commonly used points for screw mounting locations. If more screw mounting locations are available, it is highly recommended that they be used as well.

Once the locations for both the screws and the nylon stand-offs have been identified, remove the board, insert the nylon stand-offs, making sure all the stand-offs are in their proper position and are not causing the board to warp. Then install the board into the chassis. Then lock the system board into place by installing the screws. Do not over-tighten. Usually 1/8 turn after the screw-head makes contact is sufficient to assure a good ground.

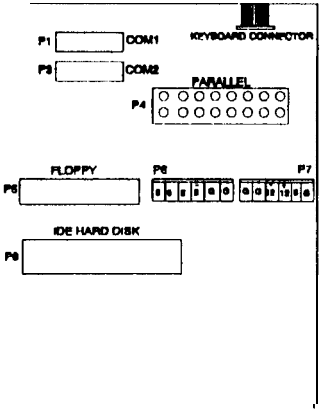

Figure 1-4: I/O Port Connections for the MVE488

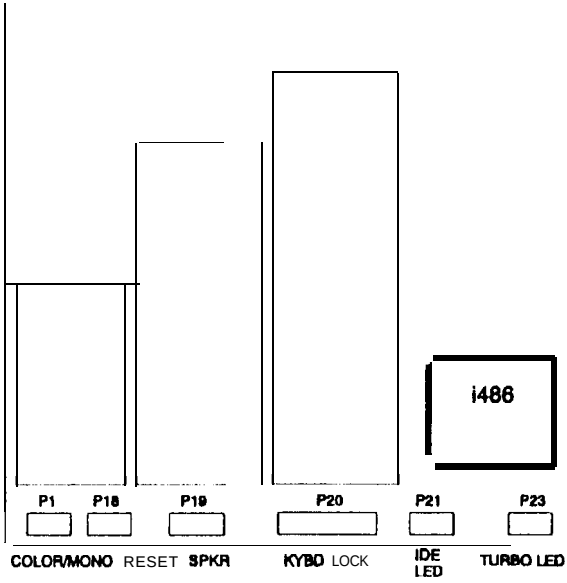

Figure **I-5:** MVE466 **Cable Connectors**

Connecting Cables

Connect the power cables from the power supply to the system board. Then install any ribbon cables **from** the internal peripheral controllers to the disk drive(s) and I/O port connectors. Be sure the red or blue stripe along the edge of the ribbon cable is connected to Pin **1**. See figure I-7.

Note: *Pin 1 for all the I/O interfaces is marked by both the number 1 and a white triangle located in the corner of the connector.*

Connect all the control panel cables. See figure I-8.

Finishing Hardware Installation

Once the system board has been mounted and screwed in place, install the video adapter and any other peripheral adapters into the board. Check each of the cables to ensure they are properly installed.

Note: *The Mylex BIOS has its own section that was included with this manual. There is only minimal information provided within this section and the Mylex 486 ISA BIOS Users Guide Section should be consulted for more information.*

The Mylex BIOS that is installed on the MVE486 has a built-in CMOS setup program like many other BIOSs available. To access the setup screen, press the F2 function key at any time when prompted during the POST. (Power On Self Test)

Use the setup screen to configure the floppy drives, hard drives, video display type, and I/O options. For cursor movement and other commands, follow the on-screen prompts.

Chapter 2: Upgrading

There are two major components that may be upgraded on the MVE486 system board. They are the CPU, and the Cache memory. This section covers the Cache upgrade in detail.

Please refer to Chapter 1 for CPU upgrade information.

Upgrading the Cache

The MVE486 supports a total of 3 different cache sizes--64, 128, and 256K. Generally, increasing the cache size, increases system performance. While the increase in performance is not linear, programs with repetitive routines or average size data blocks with benefit the most from a larger cache size. These programs include spread sheets and CAD programs.

The cache on the MVE486 has 4 major components:

- The cache controller -- This is the logic that controls the cache and is built into the chip set.
- The cache **memory --** A set of high speed, SRAM memory where the data is stored.
- The **cache tags --** One or two SRAM chips that keep track of what locations of main memory are stored in the cache.
- Dirty bit buffers -- One smaller SRAM chips that is used to control whether the information in the cache needs to be written back to main memory.

When upgrading the cache, the cache memory, and cache tags are affected. Table 2-I lists the various

cache sizes, and where SRAM chip sizes and speeds should be installed. Use this table to determine what SRAM chips need to be purchased. Please refer to Appendix B for Cache upgrade part numbers.

CACHE RAM GUIDE

	BNK 0 U58, U59, U69, U70	BNK 1 U60, U61, U71, U72	Tag RAM 0 U57	Tag RAM 1 U56	Cacheble Memory
64K Cache	8K x 8 20ns	8K x 8 20ns	8K x 8 15ns	EMPTY	16MB
128K Cache	32K x 8 20ns	EMPTY	8K x 8 15ns	EMPTY	32MB
256K Cache	32K x 8 20ns	32K x 8 20ns	8K x 8 15ns	8K x 8 15ns	63MB*

*** To facilitate cache flushing/invalidation, the 1 MB area between 63MB to 64MB is always non-cached.**

Installing the Cache Memory

Warning: SRAM Chips are high/y static sensitive devices. Precautions should be taken to prevent static damage to these components.

Installation Steps:

1. Remove the MVE486 board from the chassis,
2. Using figure 2-1, locate which chips need to be removed and installed.
3. Carefully remove chips (if any) from their sockets by using a chip removal tool, or sliding

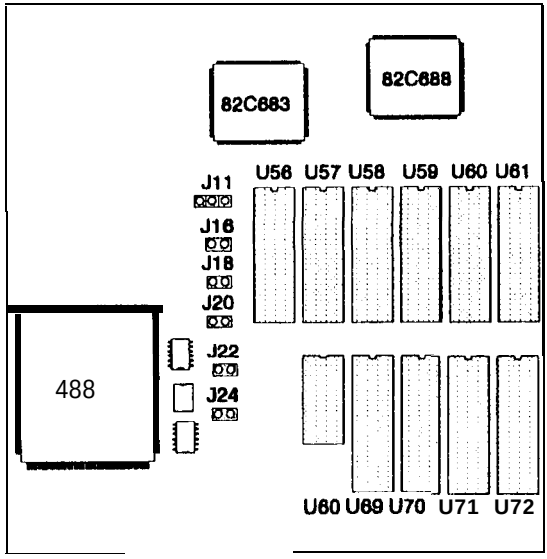

Figure 2-1: MVE486 Cache

a small flat blade screwdriver under the chip and gently rocking the chip out of its socket.

4. Carefully insert the new chips. Make sure to orient Pin 1 in the correct position--toward the top of the board. Visually inspect each chip after it is installed to make sure that none of the pins were bent under the chip.
5. Set the jumpers for the new cache size. See table 2-2.
6. Re-install the system board into the chassis.
7. When the system is powered back on, the BIOS should identify the new cache size and adjust the CMOS configuration automatically. If the BIOS does not identify the correct size of cache, immediately disconnect power and check the jumper settings and SRAM chip installation, Contact your supplier if problems persist.

CACHE JUMPER TABLE						
	J11	J16	J18	J20	J22	J24
64K	2-3	CLOSE	OPEN	OPEN	OPEN	OPEN
128K	I-2	CLOSE	OPEN	CLOSE	OPEN	CLOSE
256K	2-3	CLOSE	CLOSE	CLOSE	CLOSE	CLOSE

Chapter 3: Troubleshooting

This section contains a brief series of problems and solutions that comprise the most common questions posed during the troubleshooting of an EISA bus system board. Please review these questions before contacting your supplier's technical support. In addition to this section, please review the BIOS Users Guide for additional information on BIOS generated error messages.

P. No video and a series of beeps.

S. Check the BIOS section of this manual to identify the beep codes and follow the procedures identified; check the video card in a different slot and/or different computer.

P. Floppy light is always on.

S. The floppy cable was installed backwards. Reverse the cable.

P. System will not boot from floppy.

S. Confirm the setting within the CMOS table is correct; make sure the cable is good; make sure there is a terminating resistor on the floppy drive.

P. The IDE hard disk will not spin up.

S. Check the power cable and IDE cable.

P. The HD LED on the system board does not operate.

S. Some IDE disk drives do not support the LED function on the IDE cable. Rather they provide an LED on the disk drive itself or, an LED connection on the disk drive. Connect the control panel LED to the disk drive.

P. The system's I/O ports do not work.

S. Confirm the CMOS setup has been correctly configured; check the ribbon cable installation.

P. Ethernet adapter does not work.

S. Most ethernet cards use IRQ3 as a default setting. The MVE486 uses IRQ3 for the COM2 serial port. Either disable COM2 or change the ethernet adapter settings,

P. Serial ports will not properly run a serial mouse.

S. Make sure the power supply has adequate +/- 12 volt supply being delivered to the system board.

P. OS/2 will not print from the parallel port.

S. OS/2 requires the IRQ for the parallel port to be active. Make sure the parallel port(s) have the IRQ line correctly configured.

Chapter 4: Technical Reference

The following pages cover the basic specifications, benchmarks and pin-out assignments of connectors on the MVE486. Please note that this data is provided for informational purposes only and is subject to change without notice.

Specifications

System	Descrlptfon
Processor Type	Intel 80486DX DX2, or SX
System Speed	20, 25, 33
Host Interface	EISA
Slots	Four 32-bit EISA bus master slots, two VESA VL bus master slots
Memory	**Description**
Memory Type	36-bit, 60 or 70 ns. fast page-mode SIMM
Memory Sizes	512Kx36, 2Mx36, 8Mx36, 1 Mx36, 4Mx36
Configurations	As indicated in Table 1-1, page 1-3.
Cache Type	Direct cache, adaptive write-back cache
Cache Size	64-Kbytes, upgradable to 128-Kbytes or 256Kbytes

I/O Interfaces	Description
Serial Ports	Two, COM1 and COM2, up to 54Kbaud on DB9 connectors with 16 Byte FIFO.
Parallel Ports	Centronics-compatible DB25
FloppyControls	Two, 5-l /4" or 3-1/2" 2.88, 1.44, 1.2 720 and 360 K sizes
IDE	For drives with Integrated Drive Electronics (AT BUS)
I/O settings	All I/O configurations executed through BIOS

BIOS Subsystem	Deacriptlon
BIOS Type	Mylex 486 EISA BIOS
BIOS Features	Built-in setup, Power-on self-test (POST), drive table optimized for IDE drives, user-definable drive type, auto ID for disk IDE disk drives, password protection.
BIOS Shadowing	System and video shadowing supported Optional COOO, D000 and EOOO Segment Shadowing

Operating Environment	Description
Power Requirements	5 amps typical at 5 volts, 30 milliamps at 12 volts
Temperature	32°F to 132°F (0°C to 50°C)
Humidity	Up to 90% noncondensing

Physical Specifications	Description
On-Board Battery	Integrated in real time clock chip (DS 1387)
Size	13" x 8.6" (Baby AT form factor)
Weight	1.6 lbs net

I/O Port Connections

Serial Port		Parallel Port	
PIN	Function	PIN	Function
1	DCD	1	STB
2	DSR	2	AFD
3	RxD	3, 5, 7, 9, 11, 13, 15,17	DO-7
4	RTS	4	ERR
5	TxD	6	INIT
6	CTS	8	SLIN
7	DTR	19	ACK

8	RI	21	BUSY
9	GND	23	PE
10	N/C	25	SLCT
		10, 12, 14, 16, 18, 20, 22, 24, 26	GND

Appendix A: System Planning Worksheet

ADAPTER	IRQ	I/O Address	Memory Address
COM1	4	3F8-3FF	N/A
COM2	3	2F8-2FF	N/A
LPT1	7	378-37F	N/A
LPT2	5	278-27F	N/A
EGA/VGA-RAM	2/9	3C0-3CF	A000:0 - A7FF:0
EGA/VGA-ROM			COOO:O - C7FF:0
Mono		3B0-3BF	BOOO:O - B7FF:0
Bus Mouse			
FAX/Modem			
Hard Disk Ctlr.			
Network Card 1			
Network Card 2			
Other 1			
Other 2			

Instructions: For each adapter that is installed in the system, fill out the pertinent information in the space provided. Make sure that no two components occupy the same IRQ, I/O Address and Memory Address.

Appendix B: Upgrading the MVE486

The MVE486 can be upgraded in three areas: The CPU, the DRAM memory, and Cache size. Your supplier should be able to provide all three upgrades. SRAM chips can be hard to find, it may be necessary to contact Mylex to identify a local dealer or distributor who carries these parts. The Mylex customer service phone number is (510) 796-6100 and is available Monday through Friday 8:00 a.m. - 5:00 p.m., Standard Pacific Time.

The following information may assist in locating approved parts or ordering upgrade kits/parts from Mylex.

Cache Memory

Tested and approved SRAM chips include:

APPROVED SRAM CHIPS		
CHIP	MANUFACTURER	**PART NUMBER**
8K x 8	ISSI	1 S61 C64A-20N
	Motorola	MCM6264BP - 20NS
	Performance	P4C164-20 PC
32K x 8	ISSI	IS61C256A-20N
	Micron Technology	MT5C2568-20
	Alliance	AS7C256-20

Note: Other SRAM chips may be acceptable. Check with your supplier to confirm specifications.

Mylex Upgrade Kits

UPGRADE KITS	
DESCRIPTION	PART NUMBER
*128K Cache Upgrade Kit	AKITCU-128
256K Cache Upgrade Kit	AKITCU-256

* Default configuration.

Note: 64K *configuration is a/so available.*

MVE486 EISA System BIOS

SECTION 2

Chapter 1: BIOS Overview

The Mylex System BIOS was developed to ensure compatibility for building advanced personal computer systems or workstations. The 486 System BIOS supports the highest performance 80486, as well as the widest range of products on the Extended Industry Standard Architecture (EISA) bus.

BIOS Structure

The EISA specification for system boards provides for ROM based firmware that is integrated within the overall system. Mylex has developed this software, usually referred to as the "BIOS" for use with their 80486-based EISA system boards. The system BIOS contains three functiontional components. They are:

- **System BIOS (Basic I/O system)** This is a collection of routines and interrupt handlers that are used by industry standard software to perform I/O operations on commonly used devices.
- **System POST (Power-on Self Test)** This program receives control when power is initially applied to the system or a system reset operation is performed.
- **System SETUP** This program is run when the CMOS database provided on the system board requires modification.

This manual describes the POST routine, the SETUP routine, and the operational error messages provided by the system BIOS from a user's point of view.

Chapter 2: BIOS Setup

Invoking Setup

The SETUP program allows the user to edit the CMOS configuration information provided on the system board. Whenever the power is first applied to the system, or the system is reset, the CMOS RAM is accessed to determine the configuring parameters.

There are two conditions that invoke SETUP. They are:

- When an error occurs during the POST routine, an option to enter setup is displayed.
- When instructed by the BIOS, before the operating system is loaded.

If the system detects an error with the CMOS database, it will inform the user with a screen message or series of beeps. If a screen message appears, SETUP can then be invoked by pressing the function key as indicated in the message.

The setup program is accessed by pressing the [F2] key when prompted after the POST test and prior to BOOT-UP. The POST test may be displayed by pressing the [P] key when prompted.

The CMOS setup program is similar to many other ROM-based setup programs on the market and is completely menu driven,

Move the cursor, shown as inverse video, between fields by using the up and down arrow keys.

For fixed variable fields, such as “enable, disable” the options available will be displayed to the right of the cursor. Select from the displayed variables with the numeric keypad plus "+" and minus "-" keys.

For fields with a larger number of variables such as “Date” use the plus "+" and minus "-" keys to toggle the field value up or down respectively.

Once you have completed the SETUP, save it by pressing the "S" key. If a mistake was made, or if you do not wish to save your changes, press the "Q" key to quit.

On the following pages are examples of the setup screens for the MVE486 system board.

Proceeding those figures are detailed descriptions of each field and their options.

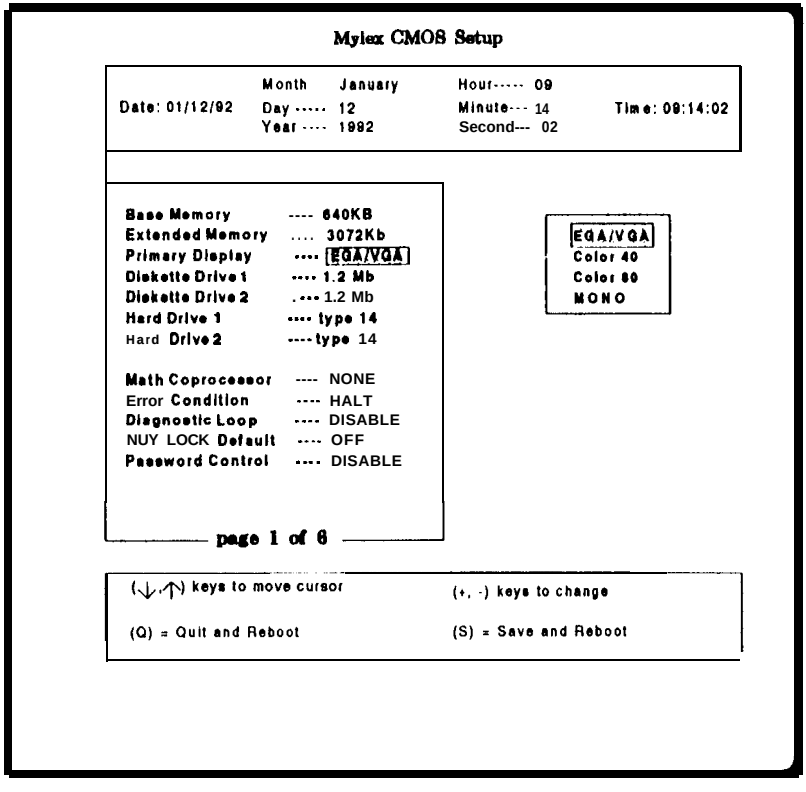

Figure 2-1: Mylex CMOS Setup Screen 1 for the MVE486

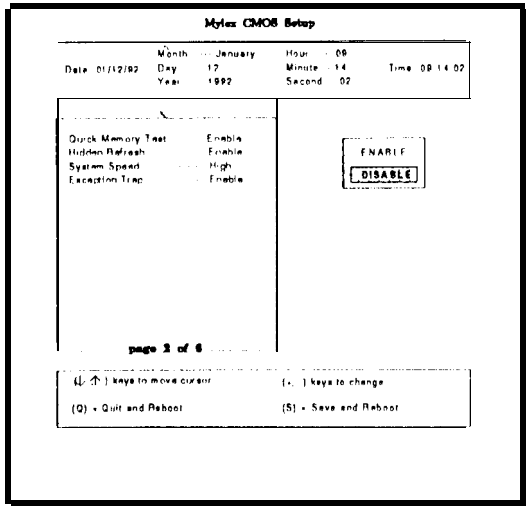

Figure 2-2: Mylex MVE486 CMOS Setup Screen 2

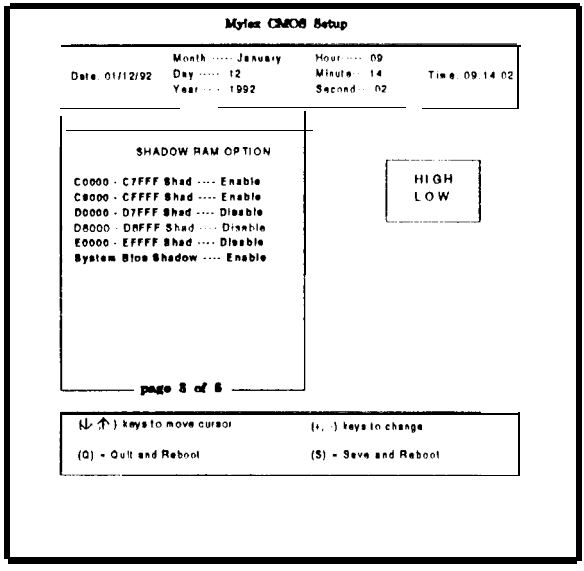

Figure 2-3: Mylex CMOS Setup Screen 3

Setup

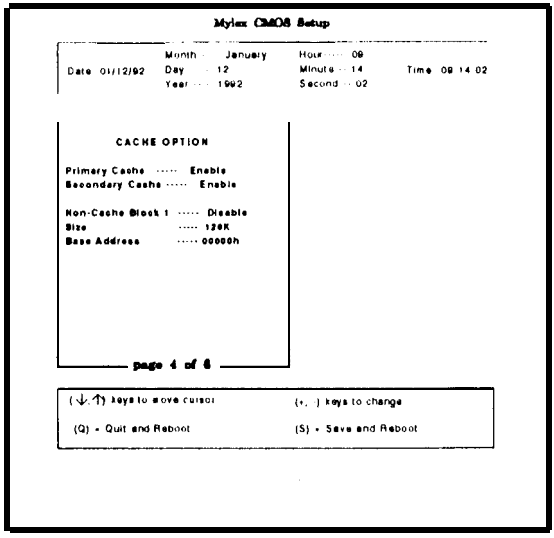

Figure 2-4: Mylex MVE486 CMOS Setup Screen 4

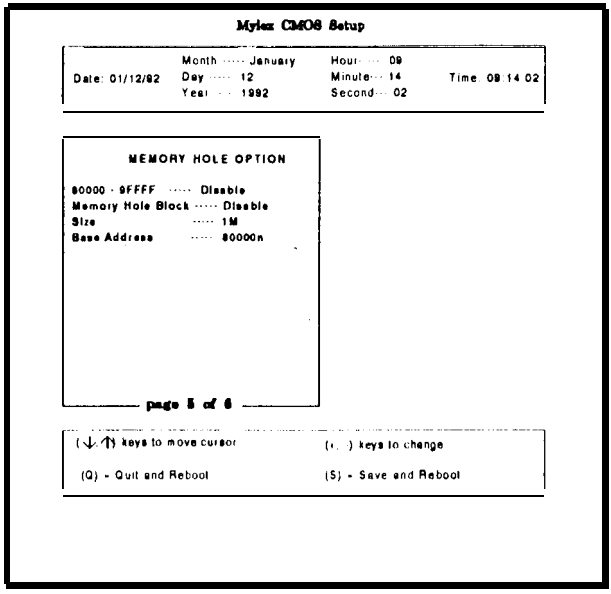

Figure 2-5: Mylex MVE486 CMOS Setup Screen 5

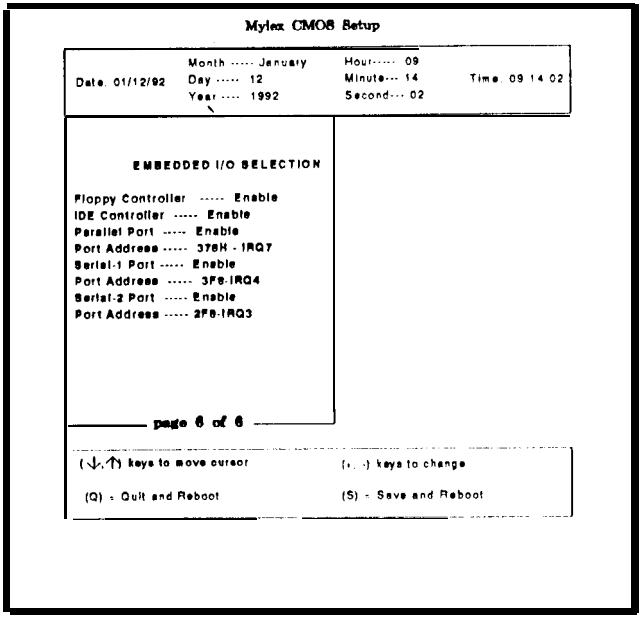

Figure 26: Mylex MVE488 CMOS Setup Screen 8

Setting the Options

The following options are the current options available.

Time and Date Use the arrow keys to move from field to field. Use the plus and minus keys to change the months, days, years and time. You will notice a calendar appears when setting the date.

Base Memory The base memory setting should be set automatically by the system, based upon the jumper settings. Normally this is 640K. This provides the maximum amount of memory for DOS and non-protected mode applications to run.

Reserve Memory This feature allows the system to subtract a specific amount of memory from the base memory in order

for some peripheral adapters to run in lower memory. You may subtract 64, 128 and 192-KBytes of RAM from the base memory allocation. When this option is used, ensure the base memory field is set to reflect the "subtracted" amount of memory or errors may result.

Note: *This option removes useable memory from DOS applications. It should be used only when required by a perhiperal adapter.*

Important: *When running the EISA configuration utility, make sure this option is enabled and correctly specified in the "View Configuration--Memory" field.*

Extended Memory

This is the remaining memory available in the system. The value in this field is automatically set by the system based upon the jumper settings for memory. The amount shown should be the total amount of RAM installed minus 128K for systems with less than 8MB, and 384K with systems of 8MB or greater. This deallocation of memory is done regardless of cache or snadow settings.

Base and Extended Memory

These two fields are automatically set by the BIOS. Confirm the numbers displayed match the actual amount of memory. **Note:** 384K of memory will always be deallocated from Extended Memory. Use description from 486-EISA Manual--Base, Reserved and Extended.

Primary Display

The available options are: EGA/VGA, CGA40, CGA80 and MONO.

Diskette Drive 1 and 2

Diskette drive "1" refers to the "A:" floppy drive, "2" refers to the "B:" drive (if any). There are six options available. They are: None (for diskless applications) 360 Kb, 1.2 Mb for 5 1/4" floppy drives, 720 Kb, 1.44 and 2.88 Mb for 3 1/2" floppy drives.

Hard Drive 1 and 2

Note: *Some disk controllers, ESDI and SCSI in particular, are commonly referred to as "smart" controllers because they use the drive type "1" setting*

for any size disk drive installed. If an IDE or "AT BUS" drive is installed, the Mylex BIOS is capable of automatically setting the configuration. Use "Type2/Auto" in the BIOS for IDE drives if you wish to have the BIOS automatically set the drive parameters. If a problem arises using the "Type2/Auto" setting, review the documentation provided with the disk/drive controller and set the parameters manually.

Hard drive "1" refers to the first physical drive in the system, "2" refers to the second drive in the system, Additional drives must be configured with device drivers. For more information on device drivers, refer to the operating guide of the operation system being used.

There are 49 options available. They are: None, for no hard disk installed, *47* predefined disk drives and one user definable drive option. Refer to information provided with the disk drive for the proper drive setting. If none of the preset listings apply to the drive being installed, select type *"48"* and then "P" to begin programming. Use the right and left arrow keys to move through the fields and the "+" and "-" keys to change the variables in each field defining particular information on the number of cylinders (CYLND), heads (HEAD), sectors per track (SEC/TK), write precompensation (PRECOM), and landing zone (LZONE). The total capacity of the drive will automatically be determined after the definable fields have been specified. Once all the definable fields have been specified, press "E" to exit the programming option for drive types.

Math Coprocessor

The option should always read "Installed." If it does not, check the microprocessor.

Error Condition

The three options are: Halt, No Halt (on any error), NoKB/Video. When an error occurs during the POST, the "Halt" selection will cause a prompt to be displayed providing the option to continue or enter SETUP. The "No Halt" option will simply display the error but will continue to boot the system without

stopping. The NoKB/Video option will halt the system on any error except a missing keyboard or video adapter. This latter option is useful for network servers that have keyboards removed or key-locks turned off.

Diagnostic Loop

When enabled, this option will place the board into a continuous POST loop. Should an error occur during the loop, it will be displayed on the screen. To break out of the loop, press the F2 function key after the completion of the memory cycle. Note: This loop requires the use of the same memory that is used for the user definable drive type. If the Diagnostic Loop is enabled, the user definable drive (if any is be used) will have to be reset.

Password

Use this option to enable or disable password protection. If this field is enabled, the password input selection screen appears after "S" for save and exit has been depressed. Once this option is enabled, a password must be input before the system will boot or any change to the SETUP can be made. **Note:** The password is case and space sensitive. Use caution when selecting a password. Once the password is enabled, the only way to disable or change it is with the password previously entered. DO NOT LOSE THE PASSWORD.

BIOS Shadow

This option copies the system board's ROM BIOS information from slower ROM type of memory to faster RAM. Enabling this option will help to increase the performance of the system.

C/D/E000 Shadow

Like the previous shadow option, information that may reside in ROM in the C000-C7FF, C800-CFFF, D000-DFFF and EOOO-EFFF (hex) ranges of memory are copied from ROM to faster RAM. This option should not be enabled unless an expansion board has ROM memory that resides in that address block, and no RAM type of memory is used in that same block. **Note:** If these options are enabled, make sure that EMS drivers or "Load High" routines do not use the corresponding ranges of shadowed memory.

Hidden Refresh

This feature enables the chipset to refresh the DRAM during CPU cycles not otherwise used for refresh. This improves system performance by about 3%.

Note: Depending upon the DRAM being used, (commonly 4 and 16MB SIMMs) the hidden refresh feature may exceed the timing parameters of the DRAM. If memory problems are encountered, disable this feature.

Quick Memory Test

This option, when enabled will reduce the amount of time the POST will spend testing DRAM memory.

I/O Ports (Floppy, IDE, Serial, Parallel)

Use these fields to enable or disable the port(s) and/or select the port address.

Note: Since some operating systems assign a logical "COM1 or LPT1" to a phyiscal port, use the following data to select the serial and parallel port settings.

	Address	IRQ	Normally
Parallel	3BCh	7	LPT1
Parallel	378h	7	LPT2
Parallel	278h	5	LPT3
Parallel	378h	5	Optional*
Serial	3F8h	4	COM1
Serial	2F8	3	COM2
Serial	3E8	4	COM3
Serial	2E8	3	COM4

** Note: These are optional settings, and may not be compatible with all operating systems.*

System Speed The two options are: "Low" and "High." Selecting "High" will run the system board at the maximum clock speed, i.e. 33MHz. The "Low" option will run the system board at 8MHz. This option is useful for debugging problems or running speed sensitive software.

Exception Trap This option is used to enable or disable a feature in the Mylex BIOS that traps illegal instructions made by software programs. When this feature is enabled, errors will be trapped and the location in memory where the error occured will be displayed in hex. With this option disabled, the system may either ignore the instruction or hang depending upon the circumstances. For more information review Appendix A in this section.

Primary Cache This option may be used to enable or disable the 486's internal cache memory.

Secondary Cache This option may be used to enable or disable the external cache on the MVE486.

Noncache Block 1 Because certain expansion boards have shared memory, that is memory used by both the adatper and the system board that resides on the adapter. This option was provided to ensure compatibility with these expansion boards. If an expansion board that uses shared memory addressing above 1 MB (decimal) is installed, use this option to disable caching this memory area.

For example, an adapter board such as a frame grabber that uses 512K of shared memory is installed at 15.5MB (decimal). The Non-Cache Block 1 should be enabled. The size of the non-cache block should be set at 512K and the base address of the non-cache block should be set at 15.5MB. **(Note:** Except normal video memory addresses, memory in the 384K "shadow zone" between 640K and 1 MB is never cached.)

Memory Hole

8000-9FFFF: The MVE486 allows the user to configure the memory on their controller cards below 640KB. A Maximum of 128KB of expansion memory can be mapped below 640KB.

Another Memory Hole above 1MB of size 512KB, 1MB or 2MB can be enabled so that expansion boards can configure the memory in this memory space.

For example: A user wants to configure their Token Ring adapter with memory of 512KB to be configured at 30000000 to 3007FFFF. The user can enable this Memory Hole with the starting address at 30000000. The user will see that the 512KB of memory is reduced at the base board.

Chapter 3: The POST Routine

When power is first applied to the system, or the system is reset, the initial boot screen appears. The first line of the screen indicates the type and version of BIOS that is installed. The system will then perform the Power On Self Test (POST). POST tests the different components of the system and compares them to the CMOS SETUP configuration. If there is a discrepancy or a hardware fault is detected, one of the following actions will be taken.

If POST has not been able to initiate a video system, a coded sequence of tones will be played on the system speaker. If a video system is available, an error message will be displayed.

Part of the POST is the RAM test. The RAM test checks all available RAM on the system board twice. During the test, the amount of base memory and extended memory is reported on the screen. To abort this process, any key can be pressed.

Speaker Output (BEEP) Codes

A sequence of BEEP sounds will be output to the Speaker when:

- POST detects a fatal error.
- A BEEP code will be output when the BIOS detects a fatal error, then halt the system.
- When the Diagnostic (Loop) Mode is enabled
- At the end of every POST this BEEP sequence will be outputed to identify the problem.

There are only two BEEP sounds used to decode the error:

- Long Beep (LB) = ERROR
- Short Beep (SB) = NO ERROR

Error Beep Decoding

An error can be decoded by remembering the number of beeps you hear when you hear a long beep (LB).

Following are the beep code definitions according the position number of the long beeps (LB).

1 — Always a long beep to signify the start of beep decoding

2 — Video card BAD or no video card

3 — Keyboard controller error

4 — Keyboard error

5 — Programmable interrupt controller (8259-l) error

6 — Programmable interrupt controller (8259-l) error

7 — DMA page register error

8 — RAM refresh error

9 — RAM data test error

10 — RAM parity error

11 — DMA controller 1 error

12 — CMOS RAM failure

13 — DMA controller 2 error

14 — CMOS RAM battery failure

15 — CMOS checksum failed

16 — BIOS ROM checksum failed

Example 1:

If errors are: (Keyboard error) and (RAM parity error) you will hear the following.

LB - sb - sb - LB - sb - sb - sb - sb - sb - LB

1 2 3 4 5 6 7 8 9 10

Example 2:

If errors are: (No Video), (RAM refresh) and (RAM data) you will hear the following.

LB - LB - sb - sb - sb - sb - sb - LB - LB

1 2 3 4 5 6 7 8 9

POST Code (Port 80h) Definitions

01	CPU TEST
02	DMA PAGE REGISTER TEST
03	KEYBOARD CONTROLLER TEST
04	BIOS ROM CHECKSUM
05	SEND KEYBOARD COMMAND TEST
06	CMOS RAM TEST
08	RAM REFRESH TEST
09	FIRST 64K MEMORY TEST
OA	DMA CONTROLLER TEST
OB	INITIALIZE DMA
oc	INTERRUPT TEST
OD	DETERMINE RAM SIZE
OE	INITIALIZE VIDEO OF EGA/VGA CHECKSUM
10	SEARCH FOR MONOCHROME CARD
11	SEARCH FOR COLOR CARD
12	WORD SPLITTER AND BYTE SHIFTER TEST
13	KEYBOARD TEST
14	RAM TEST
15	TIMER TEST
16	INITIALIZE OUTPUT PORT OF KEYBOARD CONTROLLER
17	KEYBOARD INTERRUPTTEST

POST Code (Port 80h) Definitions

(continued)

18	INITIALIZE KEYBOARD
19	REALTIME CLOCK TEST
1A	COPROCESSOR TEST
1B	RESET HARDDISK/FLOPPY CONTROLLER
1C	INITIALIZE FLOPPY
1D	INITIALIZE HARDDISK
1E	CHECK OPTION ROM (C800 - DFFF)
IF	INITIALIZE SERIAL AND PARALLEL PORTS
20	INTIALIZE TIME OF DAY
21	CHECK OPTION ROM (EOOO-EFFF)
22	LOOK FOR BOOT DEVICE
23	BOOT FROM FLOPPY DISK
24	BOOT FROM HARD DISK
25	A20 ENABLE/DISABLE FAILURE
26	PARITY ERROR
FF	FATAL ERROR OCCURED (SYSTEM HALTED)

Chapter 4: Installation

Precautions

Observe the following precautions before handling and installing the system board and its components.

Handling the System BIOS

Your system BIOS is a sensitive component that is prone to damage from electrostatic discharge. This is an electrical charge that every human body carries, and will discharge when you touch the metal of the system BIOS and may damage the component. Therefore, discharge all of the electrostatic charges from your body to ground before touching the system BIOS and avoid touching any of the system BIOS metal legs.

Replacing the BIOS

Caution: "Wear a ground strap before touching the system'

Removing the Old BIOS

First locate the BIOS on the system board (refer to the User Manual if necessary). Carefully remove any peripheral cards that obstruct access to the BIOS. The system BIOS can be removed most easily with a ROM (or chip) puller. If a puller is not available, then the BIOS can be carefully pried out of it's socket with a small flat-blade screwdriver. The BIOS should be first loosened from the socket by prying from one side, and then the other.

This process should be repeated until the BIOS is removed. This will reduce the stress on the legs of the **BIOS,** and will allow it to be reused (after erasing and reprogramming).

Replacing the BIOS

Usually the system board is shipped with the BIOS ROM chip already installed. If you must replace the ROM chip, use these steps:

Check the New BIOS

Verify that the BIOS to be installed is compatible with the chip set and cache memory controller installed on the system board.

➤ Verify that the BIOS chip is a 28-pin, 27512 chip, with a 200 ns access time.

- Verify that the BIOS chip is marked MVE BIOS.

Installing the New BIOS

Locate where the chip is to be installed.

➤ Make sure pin 1 on the chip corresponds to pin 1 of the socket by aligning the notch on the chip with the silkscreened notch on the syslem board. Make sure the chip faces the front of the chassis (away from the I/O connectors). Align the pins with the socket hole, then push the chip down carefully until the pins are seated securely in the socket. Be careful not to bend any of the pins.

- You are now ready to power up the system, and run the SETUP Utility (see chapter 2 SETUP for more information).

Appendix A: Error Messages

Power On Self Test and Initialization Error Messages

The following messages are fatal, or rather prevent the computer from continuing further, and may require service by Mylex. Before contacting Mylex's Technical Support, turn the power off for a few minutes then attempt to reboot. If the problem persists, contact Mylex's Technical Support.

FAULTY DHA PAGE REGISTERS

FAULTY KEYBOARD CONTROLLER

FAULTY RAM REFRESH CIRCUITRY

FIRST 64K OF RAM FAILURE

Note: This error is caused by a faulty SIMM in the first bank. Changing fhe SIMMs should correct this error.

RAM PARITY ERROR IN FIRST 64X

Note: This error is caused by a faulty SIMM in the first bank. Changing SIMMs should correct this error.

ROM **CHECKSUM INCORRECT**

DMA CONTROLLER 1 FAULTY

DMA CONTROLLER 2 FAULTY

FAILURE OF WORD SPLITTER OR BYTE SHIFTER

NO REPLY FROM INTERRUPT CONTROLLER(S)'

KEYBOARD CONTROLLER FAILED SELF-TEST

NO INTERRUPTS FROM TIMER 0

UNEXPECTED INTERRUPT WHILE TESTING TIMER 0

NO INTERRUPTS FROM KEYBOARD CONTROLLER

UNEXPECTED INTERRUPT WHILE TESTING KEYBOARD CONTROLLER

The following list of messages are also fatal, but may be resolved by performing some simple operations. The BIOS message is in bold, followed by recommended procedures to fix the problem. If the problem persists, contact Mylex's Technical Support.

HISSING OR FAULTY KEYBOARD

Check the keyboard key lock. Check to make sure the keyboard is plugged in. Try a different keyboard.

BATTERY DISCHARGED

Reboot the system and re-run the CMOS SETUP. Make sure you save the SETUP.

HARDWARE INFORMATION LOST - RUN SETUP

Run SETUP. Make sure you save the SETUP.

HARDWARE INFORMATION CORRUPTED - RUN SETUP

Run SETUP. Make sure you save the SETUP.

HARDWARE INFORMATION DOES NOT MATCH VIDEO CARD - RUN *SETUP*

Run SETUP. Make sure the video card is correctly identified. Save SETUP.

COLOR/MONO SWITCH ON PCB INCORRECT

Check the hardware configuration on the system board. Check the CMOS SETUP.

STUCK KEY OR KEY PRESSED

Reboot. Try a different keyboard.

UNEXPECTED AMOUNT OF MEMORY FOUND -RUN SETUP

Check hardware memory jumpers and run SETUP

CLOCK NOT TICKING CORRECTLY -RUN SETUP

Run SETUP

TIME AND DATE CORRUPT - RUN SETUP

Run SETUP.

MACHINE IS LOCKED - TURN XEY

Unlock the keylock.

FLOPPY DISK ERROR MESSAGES

These errors are specific to the floppy disk drive(s). Follow any suggestions listed, and if the problem persists, contact your supplier's Technical Support.

NO **BOOTABLE FLOPPY DRIVE 0 INSTALLED**

There is no floppy device installed, but the CMOS SETUP has been configured for one. Run SETUP.

FLOPPY HARDWARE INFORMATION IS INCORRECT - RUN SETUP

Run SETUP.

FLOPPY HARDWARE INFORMATION IS SELF-CONTRADICTORY

Run SETUP.

FAILURE OF TRACK-ZERO SIGNAL IN FLOPPY DISK DRIVE

Either the floppy diskette or the drive is defective. Replace the media and then the drive.

FAILURE OF **FLOPPY CONTROL HARDWARE**

Replace the drive controller.

HARD DISK ERROR MESSAGES

These errors are specific to the hard disk drive(s). Follow any suggestions listed and, if the problem persists, contact your supplier's Technical Support.

HARD DISK # CONTROLLER FAILURE

The controller is not responding. Check the installation of the controller. Replace the controller.

```
HARD DISK # ERROR
```

The hard disk drive is not responding to the controller. Check the installation, both hardware and software. Replace the drive.

BOOT ERROR MESSAGES

The following messages are or may be displayed during the "boot" process. Following the instructions displayed on screen.

```
Press 'H' to retry Hard Disk, any other Key to boot from Floppy

Booting from Floppy Disk...

Please insert Boot-Disk and press any key...

Please insert valid Boot-Disk end press any key...

Non-System Disk, Please insert Boot-Disk and press any key

Booting from Hard Disk...

Hard diek absent/failed.

Hard disk boot sector invalid.
```

This means that the boot sector of the hard disk has been improperly installed or has been altered. Re-install the boot portion of your operating system.

MESSAGES FOR RUN-TIME FATAL ERRORS

The following errors are generated by the BIOS during operation of the system.

```
RAH PARITY ERROR BETWEEN ADDRESSES XXXXXXXX AND XXXXXXXXX
- RESET MACHINE
```

A RAM parity error has occured. You must reset the machine. If this error reocurrs, check the memory with a diagnostic program.

ILLEGAL INSTRUCTION TRAPPED AT ADDRESS XXXX:XXXX - RESET MACHINE

The BIOS has encountered an instruction that it cannot execute. Many times this is a result of an application that has not been properly written and should occur during the same operation each time it is run. If the error does not occur each time, the system board may have a cache or memory error which is causing the data to become corrupt. Check the system board with a diagnostic program and/or contact your supplier.

SEGMENT BOUNDARY OVERRUN TRAPPED AT ADDRESS XXXX:XXXX - RESET MACHINE

Like the ILLEGAL INSTRUCTION TRAP, an application has made a call that overflows a buffer or jumps to a memory location that does not exist.

Appendix B: CMOS Hard Drive Table

Drive No.	Cyl	Heads	Pre-comp	L-ZONE	Sec-tors	Capacity	Examples
1	306	4	128	306	17	10.65	
2	615	4	300	615	17	21.41	ST-225, ST-4026
3	615	6	300	615	17	32.12	
4	940	8	512	940	17	65.45	
5	940	6	512	940	17	49.09	
6	615	4	-1	615	17	21.41	
7	462	8	256	511	17	32.17.	
8	733	5	-1	733	17	31.90	ST-4038
9	900	15	-1	901	17	117.50	
10	820	3	-1	820	17	21.41	
11	855	5	-1	855	17	37.21	
12	855	7	-1	855	17	52.09	
13	306	8	128	319	17	21.31	
14	733	7	-1	733	17	44.66	
15		Reserved					
16	965	5	-1	965	17	42.00	Quantum Pro-40AT
17	980	5	-1	980	17	42.65	Conner CP-3044/WDA-14000
18	820	6	-1	820	17	42.82	ST-251
19	1024	5	-1	1024	-17	44.56	Miniscribe 3053,6053, ST157A
20	762	4	-1	762	39	60.86	Conners Hopi60
21	1024	7	-1	1024	17	62.39	
22	820	6	-1	820	26	65.50	ST-277R
23	1024	8	-1	1024	17	71.30	Maxtor 1085, ST-280A
24	1224	7	-1	1224	17	74.58	Maxtor2085
25	1024	9	-1	1024	17	80.22	ST-4096
26	965	10	-1	965	17	8399	Quantum Pro-BOAT
27	832	6	-1	832	33	64.34	ConnerCP-3184
28	980	10	-1	980	17	85.30	WDAC-28000
29	918	11	-1	918	17	87.89	Maxtor1170
30	1024	10	-1	1024	17	89.13	ST-1102A
31	1024	5	-1	1024	36	9437	CDC94216-106
32	1024	11	-1	1024	17	98.04	Maxtor1105
33	776	8	-1	776	33	10489	Conner CP-3104
34	1024	12	-1	1024	171	106.95	

35	1024	13	-1	1024	17	115.87	
36	1224	11	-1	1224	17	117.19	Maxtor 2140
37	918	15	-1	918	17	119.85	Maxtor 1140/CP30104
38	1024	9	-1	1024	26	122.68	ST-4144R
39	1024	14	-1	1024	17	124.78	
40	1001	15	-1	1001	17	130.69	ST-1144A
41	1024	16	-1	1024	17	142.61	
42	914	9	-1	914	34	143.20	ST-1162A
43	969	9	-1	969	36	160.75	CDC94166-182
44	1015	9	-1	1015	45	210.47	ST-1239A/WDA-P4200
45	683	16	-1	683	38	212.62	Conner CP-3204
46	1224	15	-1	1224	36	338.41	CDC94186-383H
47	1632	15	-1	1632	54	676.82	CDC94196-766
48	User Definable						

Note: Unlisted numbers have no entries, and are invalid.

