MYLEX

MSL486 Slimline System Board

Installation and Operations Guide

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PREFACE

Thank you for your choice of a Myiex MSL488 System Board product. With proper installation and care, your Myiex 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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FCC Warning:

This device has been tested and found to comply within the limits of a Class B device, pursuant to Part 15 of FCC regulations. Operation is subject to the following two conditions:

1)   This device may not cause harmful interference, and

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.

Reorient or relocate the receiving antennea. Increase the distance between the antennea and the computer. Plug the computer into a different AC outlet so that the two conflicting devices are using a different branch circuit. Contact the dealer that sold this equipment and/or a reputable radio/television service technician for additional suggestions.

CAUTION:

Only equipment certified to comply with Class B (computer input/output devices, terminals, printers, etc) should be attached to this equipment, and must have shielded interface cables.

Finally, any changes or modifications to the equipment by the user not expressly approved by the guarantee or manufacturer could void the users authority to operate such equipment.

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This product is guaranteed to be free from manufacturing or material defects for a period, of 1 (one) year after the date of purchase. Should the product fall during this period Mylex will repair or replace (at Mylex's option) the product free of charge with the following provisions:

1) Proof of purchase must be provided.

2) The product must have been property installed in accordance to the documentation provided.

3) The product must not have been modified by any party except by Mylex or an authorized agent.

4) The product must be free of damage.

Any software, including firmware, is provided "as-is" without warranty of any kind, expressed or implied. The purchaser bears complete risk of the performance and quality of the software. Mylex's sole responsibility, and the purchaser's only remedy to any defect in workmanship, shall be replacement of the defective medium (diskette or ROM).

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All products returned to Mylex for warranty service or for other reasons, must be assigned a RMA number before shipment to Mylex. The RMA number may be obtained by contacting Mylex's Technical Support Department. Any product received without a RMA number will be returned to the shipper unopened.

Important Note: Only the company (or individual) that purchased the product directly from Mylex may obtain an RMA number. If the Mylex product was purchased from a reseller or distributor, you must contact that company for service.

The following rules/procedures apply to all **RMAs:**

   1)   The product must be returned in original packaging or other suitable materials.

   2)   Each returned unit will be inspected for damage or other inegulariiies. 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.

Products must be shipped to Mylex with freight paid. Upon completion of service, Mylex will ship the product back UPS Ground or similar service, at no charge, unless prior arrangements have been made.

Customer Service

Mylex Technical Support is available 8:00 a.m. to 5:00 p.m. pacific standard time, Monday through Friday except holidays. They can be reached at (510) 796-6100 or by FAX at (510) 7457715. End users are required to contact their suppliers.

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Introduction

Thank you for making the decision to purchase the **Mylex** MSL488 **Slimline** System Board. With proper installation and maintenance, the **MSL486 Slimline** will provide years of trouble-free operation.

Package Contents

- MSL486 **Slimline** System Board

- This manual

- Warranty Card

- Any pertinent Release Notes available at the time of shipment

- System Problem Report Form

STATIC WARNING

Handling Precautions

The MSL486 contains electronic components that are highly sensitive to electrostatic discharge. Use extra caution when handling the MSL486 to ensure there is adequate grounding around the work are where the board is being installed. ALWAYS wear a ground strap or ground your body by touching a grounded object such as an unpainted metal device connected to power ground.

The MSL486 has delicate crystal oscillators that can break if subjected to sudden shock such as being tossed on a table. Use care when moving the MSL486 from point to point.

If Troubles are Encountered

If, during the course of installation or operation of the MSL486, the board displays improper operation, first consult this manual's Trouble shooting 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 the Mylex Technical Support Department at (510) 796-6100. Be sure to have the enclosed System Problem Report completely filled out.

Overview

The unique feature of the MSL488 **Slimline** is that it can be easily upgraded from a 486SX CPU to a 486DX. Since a special frequency synthesizer is used, the need to change oscillators is eliminated.

Contents:

This manual is broken down into 8 major chapters. The following is a description of each section.

What You Will Need

Before you begin to install the MSL486 in **a** chassis, the following tools will be required:

- A Phillips and flate blade screwdriver

- Plastic stand-offs (normally supplied with the chassis)

- 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 MSL486 Slimline board.

Chapter 1: System Upgrades

This chapter has the instructions for installing or upgrading these components:

- Option boards
- System Memory **(SIMMs)**
- Disk drives
- Microprocessor chip
- Video Memory
- Grounding Procedure

CAUTION: Static electricity can *destroy system components. A component with static damage may fail or* cause *data loss soon after it is damaged, or at a later time. To prevent static damage, make sure that you are grounded when handling system components. You can do this in one of two ways:*

1. Dissipate any static charge you may be carrying by touching the metal power supply housing while the computer is turned off, but still plugged in. The power supply housing is located on the back of the system. If you walk away from the system during the installation procedure, plug the power cord back into the system, touch the power supply housing and unplug the system.

2. The **best way to prevent static damage to components is to wear a grounding strap.** A grounding strap prevents static damage by providing a ground for electro-static discharge. The strap is worn around your wrist and the other end is fastened to a grounded object (such as the system chassis).
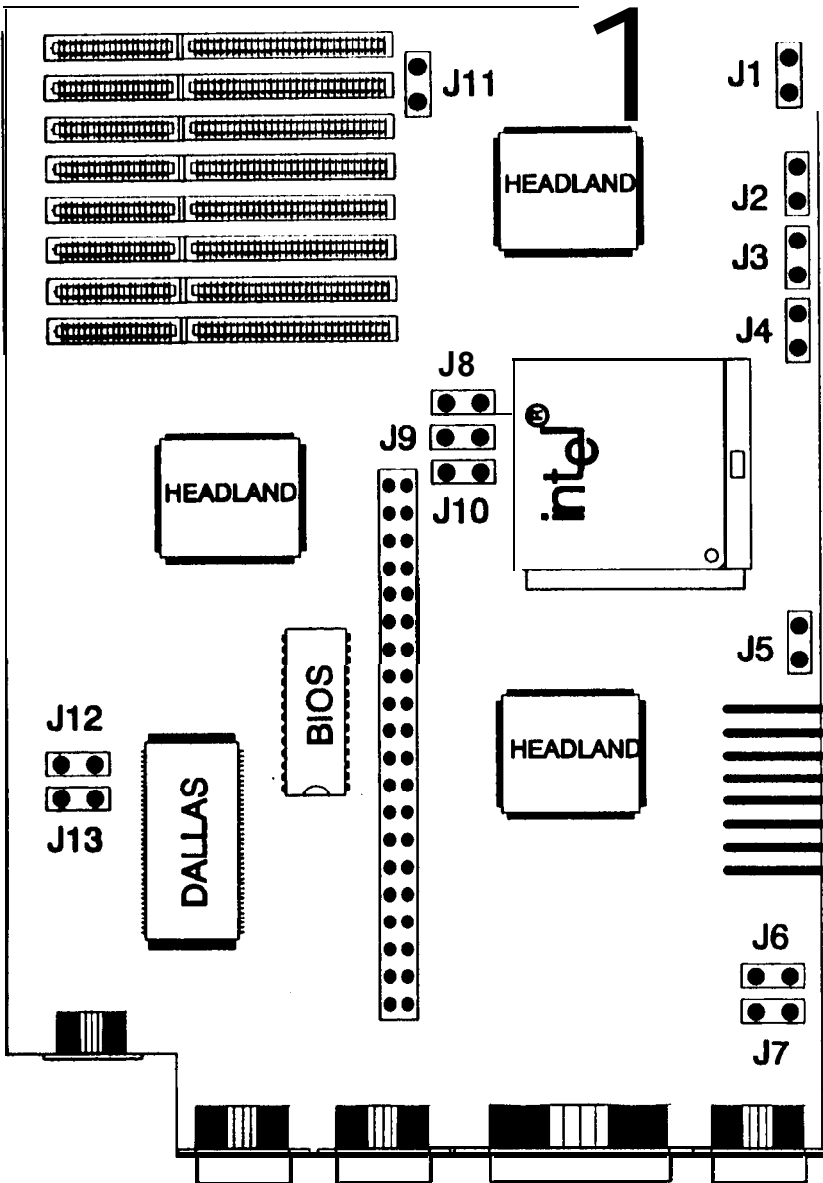
Figure I-1 : Mylex MSL486 Slimline System Board

Installing an Expansion Card

Please note the following before you install an expansion card:

The expansion cards are installed on the T-adapter, which is supplied with the MSL case.

The expansion slots are located on a T-adapter that is installed vertically on the motherboard.

The board with the T-adapter has two **8-bit** and three **16-bit** expansion slots. The **16-bit** slots can use **8-** and **16-bit** expansion cards. The **8-bit** slots can only use **8-bit** cards.

The expansion card must be compatible **with** the standard AT ISA bus.

The expansion card must operate at 8 MHz or faster. Cards slower than 8 MHz may not work properly.

Refer to the manual that came with the card to see if you need to set jumpers and switches on the card. The manual that comes with the card also provides specific installation instructions. If you have never set a jumper refer to Appendix A of this manual.

If you are installing a video card to replace the **onboard** video circuitry, disable the **onboard** video by setting jumper **J5** accordingly.

If you are installing an internal modem that can only function on **COM1** or COM2, you will need to disable one of the COM ports on the motherboard. This is done through the CMOS setup procedure.

Note: *If you disable a COM port, external devices attached to that port will not work.*

If **you** are installing a controller card to replace the on-board IDE controller circuitry, you must disable the on-board hard drive controller.

Note: Make sure you run Setup prior to installing a new controller and disable the on-board IDE controller.

Installing SIMMs

For RAM (that is, system memory), the system uses Single In-line Memory Modules, or SIMMs. The SIMMs are installed in slots on the motherboard, divided into two banks (bank 0 and bank 1). There are 4 SIMM slots per bank.

CAUTION: SIMMs are extremely sensitive to static electricity. Leave the SIMMs in the anti-static packaging until you're ready to install them. Follow the grounding procedure carefully. If possible, wear a grounding strap, which can be purchased at most computer supply stores.

Before purchasing or installing SIMMs, note the following:

- The board can use four different sizes of SIMMs: 256x9 Kb, 1 x9 Mb, and 4x9 Mb.

. The SIMMs should be 70 ns or faster.

- If you install SIMMs in a bank, you must completely fill the bank. In other words, SIMMs must be installed in groups of four. You cannot mix SIMM sizes within a bank.

- If the system is to be used as a file server for any type of network, do not mix SIMM sizes on the motherboard. That Is, use only 256Kb, 1 Mb or 4 Mb.

You can configure the system RAM in the following ways:

*Cannot be used on file-servers (see above.)

To install SIMMs, follow these steps:

1. If you are replacing **SIMMs,** remove the old ones. Starting with the first SIMM in bank 0 (the SIMM closest to the front of the system) pull the metal clips on the SIMM apart until the SIMM slips off the alignment pegs.

2. To install **a** SIMM, start with the last slot in the last bank you intend to fill (the slot farthest from the front of the system). Align the SIMM with the slot. Make sure that pin 1 **is** properly oriented. The cutaway comer on the SIMM should be towards the front of the computer. Set the SIMM in the slot. Push the alignment holes onto the alignment pegs until the SIMM clicks into place.

3. Run the CMOS Setup as described in the *Mylex* MSL466 *Setup Procedure so* that the system can recognize the new memory configuration.

Jpgrading the Microprocessor Chip

The MSL488 board is designed with a unique socket for the microprocessor; you can easily upgrade to a faster, more powerful microprocessor.

CAUTION: *Follow the* **grounding procedure in the beginning** *of this section* **carefully.**

Installing the New Microprocessor

1. Remove the cover from the system according to the instructions in the beginning of this section.

2. Locate the microprocessor.

3. Carefully pull up the lever that locks the microprocessor in place.

4. **Carefully lift out** the old microprocessor and immediately place it in anti-static packaging.

5. Remove the new microprocessor from its anti-static packaging and check to make sure that none of the pins are bent. If any pins are bent, return the chip to your dealer. Do **not attempt to etraighten the pine on a microprocessor.**

6. Align the chip with the microprocessor socket. There is a dot on the chip and at the bottom of the socket. These dots indicate pin 1 on the chip and the socket. Make sure these dots are in the same corner before inserting the chip.

7. When you are sure that the chip and the socket are properly aligned, carefully place the chip in the socket. Make sure that all the pins are properly inserted in their holes in the socket.

CAUTION: It is not necessary to press down on the chip. If the pins are properly aligned, the chip will lay flush against the socket.

6. Press the locking lever down to lock the chip in the socket. Make sure the lever is completely down, or the chip will be loosely seated and may not work *properly*.

9. Change the system jumpers to reflect the speed and type of the new microprocessor. You need to set jumpers **J1,** J2, **J3, J4, J6, J9,** and **J10.** If you don't know how to set a jumper, see Appendix A of this guide.

The following tables show the location of these jumpers and how they should be set for each type and speed of microprocessor.

Microprocessor Type	J2	J3	J4
486SX	OFF	2,3	OFF
487SX Intel Overdrive ™	1,2	1,2	2,3
486DX and DX2	1,2	1,2	1,2

Microprocessor Speed	J8	J9	J10
16 MHz	2,3	1,2	2,3
20 MHz	1,2	1,2	2,3
25 MHz	2,3	2,3	1,2
33 MHz	1,2	2,3	1,2

Note: *If you have an 80486DX2 or 80487SX Intel®
Overdrive" processor,* set the *jumpers to* indicate *half
the processor speed. For example, if you have an*
804660X2-50 *MHz processsor, set jumpers J8, J9
and J1 0 for 25 MHz. Information will still be processed
at the doubled speed.*

J1 should always have a jumper installed when the ZIF
socket is used. If you
have just installed a microprocessor in the ZIF socket,
make sure jumper J1 is ON. If ZIF socket is empty,
remove the jumper from J1.

10. Replace the cover on the system by replacing
the screws removed in step 1. Replace the
monitor and power cables, and any other
peripherals and turn the system on.

11. You must set the microprocessor speed in the
CMOS Setup.

Note: *If you have installed an 80486DX2 or Intel®
OverDrive™ microprocessor,* **set the** *microprocessor*

*speed in the CMOS Setup to half the doubled CPU
speed. For example, if you have an 804660X2-50
MHz processor, set the CPU speed in the CMOS
Setup to 25 MHz. The system will still process infor-
mation at the doubled CPU speed.*

Upgrading the Video Memory

The MSL488 system comes with either 512 KB of
video memory. You may upgrade the video board to
1 MB of memory.

1. Locate the video memory.
2. *Your* upgrade package includes four 256 KB
    ZIPs (Zig-Zag In-line Packages). Insert the
    ZIPs into sockets US, U6, U9 and U10, being
    sure to align pin 1 on the ZIPs with pin 1 on
    the sockets (pin 1 on the ZIP is indicated by a
    notch on one side; pin 1 on the socket is
    toward the outside edge of the board).

**CAUTION: Be extreme/y careful not to bend the
pins on the ZIP.**

4. Change the video memory size jumpers (J6
    and J7) to reflect the new configuration. See
    the diagram below for jumper locations.

The table below shows how each jumper should be set
for the different memory configurations:

Video Memory Size	J6	J7
512KB	ON	OFF
1 MB	OFF	ON

5. Once the ZIPs are properly installed, and the
   jumpers are correctly set, replace the system
   cover and any devices and turn the system on.

6. Because you now have 1 MB of video memory, you can install higher resolution video drivers for some software.

Chapter 2: Motherboard Technical Reference

This section is **a** guide to all connectors and jumpers on the motherboard, and includes other technical information. Refer to the motherboard diagram at the end of this session for jumpers and connector locations.

Connectors

The motherboard has the following connectors:

- Power-on **LED/Keylock** (P2)

- Turbo LED **(P1)**

- Reset button (P5)

- Speaker **(P3)**

- Hard Drive LED (P4)

- Power supply (PI 4)

- Serial port (COM2) **(P8)**

- Serial port **(COM1) (P9)**

- Printer Port (P7)

- VGA Local Bus Port (P6)

- Diskette drive controller (Pi 3)

- Hard drive controller (PI 2)

Power-on LED/Keylock (P2)

P2 is the connector for the power-on LED and keylock. The pin assignments are as follows:

PIN ASSIGNMENTS	
PIN 1	Power LED
PIN 2	No Connect
PIN 3	Ground
PIN 4	Keylock
PIN 5	Ground

Turbo LED (P1)

P1 is the connector for the turbo LEO. Connect the positive lead from the LED to pin 1.

Reset Button (P5)

P5 is the connector for the reset button on the front panel. The polarity of the connection is not important.

Speaker (P3)

P3 is the connector for the speaker. The pin assignments are as follows:

PIN ASSIGNMENT	
PIN 1	Speaker Signal
PIN 2	Ground
PIN 3	No Connect
PIN4	+5 VDC

Hard Drive LED (P4)

P4 is the connector for the IDE hard drive LED. The first two pins of this connector are for the hard drive LED wires. Connect the positive lead to pin 1.

Note: *If you have a non-IDE drive, see your drive controller manual for details.*

Power Supply (P14)

P14 is the connectors for the power supply. Pin assignments are as follows:

PIN ASSIGNMENTS	
PIN 1	Power Good
PIN 2	. +5 VDC
PIN 3	t12 VDC
PIN 4	-12 VDC

PIN 5	Ground
PIN 6	Ground
PIN 7	Ground
PIN 8	Ground
PIN 9	-5 VDC
PIN 10	+5 VDC
PIN11	t5 VDC
PIN 12	t5 VDC

The power supply connector labeled **P8** connects to pins 1 through 6. **P9** connects to pins 7 through 12. (The four black wires are ground, and should be connected to pins 5 through 8.)

Serial Port (COM2) (P8)

P8 is the **DB9** connector on the back of the system. The MSL486 is equipped with DB type connectors.

Serial Port (COM1) (P9)

P9 is another **DB9** connector on the back of the system.

Printer Port (P7)

P7 is the **DB25** connector for the Printer Port on the back of the system.

VGA Local Bus Port (P6)

P6 is the 15 pin VGA connector for the Local Bus Port on the back of the system.

Diskette Drive Controller (P13)

PI 3 is the connector for the diskette drive cable. It is a standard 34-pin diskette drive cable connector.

Hard Drive Controller (P12)

P12 is the connector for the hard drive cable. Only IDE drives can be controlled by the motherboard interface. The connector is a standard 40-pin IDE cable connector.

Jumpers

Sw the motherboard diagram at the end of this chapter for jumper locations. If you don't know how to set jumpers, refer to Appendix A of this manual.

The motherboard has the following jumpers:

- Video adapter selection (J1 1)

- Parallel port selection (J12 & J13)

- Microprocessor type and speed (JP2, JP3, JP4, JP8, JP9, JP10)

- On-board video enable/disable (J5)

Note: OFF = ENABLE, ON = DISABLE

Video Adapter Selection (J11)

J11 is for the primary or secondary video adapter, and applies only to monochrome or CGA adapters.

Microprocessor Speed (JP8, JP9, JP10)

These jumpers should be set according to the type of the microprocessor. These jumpers were set correctly for your system at the factory. You should not change these jumpers unless you change the microprocessor speed. (For instructions on upgrading the microprocessor, see Chapter 5 of this manual.)

MICROPROCESSOR JUMPER SETTINGS			
Microprocessor Speed	JP8	**JP9**	**JP10**
18 MHz	2,3	1,2	2,3
20 MHz	1,2	1,2	2,3
25 MHz	2,3	2,3	1,2
33 MHz	1,2	2,3	1,2

DMA Channels

Page Register	I/O Hex Address
DMA Channel 0	0087
DMA Channel 1	0083
DMA Channel 2	0081
DMA Channel 3	0082
DMA Channel 4	Cascade
DMA Channel 5	008B
DMA Channel 8	0089
DMA Channel 7	008A

DMA Channel	Function
0	Spare
1	Spare
2	Floppy Diskette
3	Spare
4	Cascade for DMA Channel 1
5	Spare
6	Spare
7	Spare

Interrupts

Interrupt Level	Function
0	System Timer
1	Keyboard
2	Interrupt Controller 2 (levels 8-15)
3	Serial Port 2 (COM2)
4	Serial Port 1 (COM1)
5	Paralle Port 2 (LPT2)
6	Floppy Diskette Controller
7	Parallel Port 1 (LPT1)
8	Real-Time Clock
9	Software redirected to INT 0AH (IRQ 2)
10	Reserved
11	Reserved
12	Reserved
13	Co-processor
14	Hard Disk Controller
15	Reserved

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Chapter 3: BIOS Tests and Error Messages

The following section provides a general description of the tests performed and the messages displayed by the BIOS (Basic Input/Output System).

What Happens When the System Boots

When the system is turned on (or booted) the ROM BIOS runs a series of self tests and hardware initialization processes. These tests and initializations are referred to as the POST (Power-On Self Test). The most essential hardware elements (e.g., video and RAM) are initialized first. These items must be functioning properly before the system tests can be run.

The POST compares the configuration it finds with the information stored in the CMOS chip. If a problem is detected, the POST will indicate an error by a series of tones called *beep* codes, or by displaying an error message on the screen. When the system successfully completes the POST, it loads the operating system software into RAM.

Errors and Messages Repotted by the BIOS

Some errors are called fatal. If a fatal error is encountered, the system halts after reporting the error. Other errors are called non-fatal. If a non-fatal error is encountered, the BIOS reports the error and attempts to continue the process.

Beep Codes

When the POST detects a problem, the system sounds a series of long and short beeps. The sequence of the long and short beeps indicates which error or errors have been found.

To decode the beeps, count the number of long and short beeps and the sequence in which they occur. The position of the long beeps in the sequence indicates the error(s).

The following list shows what error is indicated by the long beep position.

Long Beep Position Error Indicated

1 Signifies the start of beep decoding
2 Video card bad or no video card
3 Keyboard controller error
4 Keyboard error
5 Programmable Interrupt Controller (82591) 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

Examples

The following are some examples of beep codes and how to decode them. A long beep is indicated by "LB," and a short beep is indicated by "sb."

Example 1:

You hear the following beep codes:

Beep Type	LB	sb	sb	LB	sb	sb	sb	sb	sb	LB
Position	1	2	3	4	5	6	7	6	9	10

Long beeps occur in positions 1, 4 and 10. Position 1 Indicates the start of the beep decoding. Position 4 indicates a keyboard error, and position 10 indicates a RAM parity error.

Example 2:

You hear the following beep codes:

Beep Type	LB	sb	sb	sb	sb	sb	sb	LB	sb	sb	sb	LB
Position	1	2	3	4	5	6	7	6	9	10	11	12

Long beeps occur in positions 1, 6 and 12. Position 1 indicates the start of beep decoding, position 8 indicates a RAM refresh failure, and position 12 indicates a CMOS RAM failure.

Error Messages and Start-up Messages

This section explains the error messages that can be displayed by the system BIOS.

POST Errors

The following error messages indicate that the **Power-**On Self-Test has detected a fatal error. If you see one of these messages, turn the system off for a few minutes, then turn the system back on. If the message still appears, call **Mylex's Technical** Support to further diagnose the problem.

FAULTY DMA PAGE REGISTERS
MISSING OR FAULTY KEYBOARD
FAULTY KEYBOARD CONTROLLER
FAULTY RAM REFRESH CIRCUITRY
FIRST 64K OF RAM FAILURE
RAM PARITY ERROR IN FIRST 64K
ROM CHECKSUM INCORRECT
CMOS RAM FLOATING BIT TEST FAILURE
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 CONTROL-LER
UNEXPECTED **INTERRUPT** WHILE **TESTING** KEY-BOARD
CONTROLLER

The following errors are also fatal, but can usually be resolved by performing some simple operations. Follow the step indicated in the message, if one exists, or check the component that the message says is malfunctioning. If the problem persists, contact Mylex's Technical Support.

MISSING OR FAULTY KEYBOARD
BATTERY DISCHARGED
HARDWARE INFORMATION LOST - RUN SETUP
HARDWARE INFORMATION DOES NOT MATCH VIDEO CARD -
RUN SETUP

COLOR/MONO SWITCH ON PCB INCORRECT
STUCK KEY OR KEY PRESSED
CLOCK NOT TICKING CORRECTLY - RUN SETUP
TIME AND DATE CORRUPT - RUN SETUP
MATH COPROCESSOR HARDWARE INFORMA-
TION
INCORRECT - RUN SETUP
MACHINE IS LOCKED - TURN KEY

Diskette Error Messages

The following messages indicate an error with the
diskette drive, or the way the diskette drive is config-
ured in the CMOS Setup. If you see one of these error
messages, make sure the CMOS Setup is correct
before replacing a hardware component or contacting
Mylex's Technical Support

NO BOOTABLE FLOPPY DRIVE 0 INSTALLED
FLOPPY HARDWARE INFORMATION IS INCOR-
RECT - RUN SETUP
FLOPPY HARDWARE INFORMATION IS SELF-
CONTRADICTORY
FAILURE OF TRACK-ZERO SIGNAL IN FLOPPY
DISK DRIVE
FAILURE OF FLOPPY CONTROL HARDWARE

Hard Disk Error Messages

The following messages indicate an error with the
hard drive, hard drive controller, or the way the hard
drive is configured in the CMOS Setup. If you see one
of these error messages, make sure the CMOS Setup
is correct before replacing a hardware component or
contacting Mylex's Technical Support.

HARD DISK # CONTROLLER FAILURE
HARD DISK # ERROR

Boot Messages

The following error messages may be displayed during the boot process. Follow the instructions displayed with the message, if there are any. If there is a persistant problem, contact Mylex's Technical Support.

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 and press any key...
Non-System Disk, Please insert Boot-Disk and press any key
Booting from Hard Disk...
Hard disk absent/failed
Hard disk boot sector invalid

Run-Time Fatal Error Messages

The following messages can be displayed by the system BIOS if a fatal error is encountered while the system is running an application. If you see one of these messages, follow the suggestions under the message to resolve the problem.

RAM PARITY ERROR BETWEEN ADDRESSES XXXXXX AND XXXXXX -
RESET MACHINE

An error has been encountered in the system memory. Reset the system and run the application again. If the error message re-appears, contact Mylex's Tehcnical Support to further diagnose the problem.

ILLEGAL INSTRUCTION TRAPPED AT ADDRESS XXXX:XXXX -
RESET MACHINE

The BIOS has encountered an instruction that it cannot execute. Many times this problem is caused by an

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error in an application, and occurs during the same operation each time the application is run. Check the software configuration, or contact the software manufacturer. If the problem is random, and happens in different applications, contact Mylex's Technical Support.

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

This message indicates that an application has made a call that overflows a buffer, or jumps to a memory location that does not exist. This problem is usually caused by an error in the application, and occurs during the same operation each time the application is run. Check the software configuration, or contact the software manufacturer. If the problem is random, and happens in different applications, contact Mylex's Technical Support.

Appendix A: Setting Jumpers

When you install internal options in the system, you may need to change jumpers on the option card or on the motherboard. This section explains how to set jumpers.

Jumpers

To install the jumper, place it over the pins and push down until it completely covers the pins. Be careful not to bend the pins. You can usually remove a jumper with your fingers. If the jumper is stuck on the pins, you might need to use a bent paper-clip or a needle-nosed pliers to remove it.

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Section 2

Software Utilities

Chapter 1: Overview

About Section 2

This guide explains how to use the utilities and drivers included with onboard VGA video circuitry on the MSL488. it is organized into the following Chapters:

Chapter 1, this Chapter, is an overview of this section and **a** description of the features of the video circuitry.

Chapter 2, **Using** the VGA Utilities, explains how to install and use the utilities on the diskettes included with your shipment.

Chapter 3, Using the VGA Drivers, explains how to configure some applications by using the drivers on the diskettes included with your shipment.

Chapter 4, **Technical Information,** provides the specifications for the video circuitry and compatible monitors.

Typographical Conventions

The following typographical conventions are used in this section:

Boldface type is used for menu selections and commands that must be typed as shown.

Italic type denotes a variable value that you must supply.

items enclosed in brackets ([ ]) are optional.

Typewriter font is used for sample command lines and examples.

SMALLCAPS are used for keys and key sequences. The plus sign (+) is used to denote key combinations. For example, CTRL + F1 means press and hold down the CTRL key, press the F1 key, then release both keys.

Mylex Technical Support

If you have problems or questions that the documentation doesn't cover, the Mylex Technical Support staff is available Monday through Friday 8:00 a.m. to 5:00 p.m. pacific standard time.

Call (510) 796-6100 to talk to a support technician. Have your order number and the documentation ready.

The **Mylex Bulletin** Board System (BBS)

Mylex's electronic bulletin board system (BBS) is available to help you obtain the latest software drivers and utilities 24 hours a day. The following baud rates are available at these telephone numbers:

One **1200/2400/** 9600 baud line at (510) 793-3491.

Your communications software should be set to 8 data biis, 1 stop bii and no parity.

About the VGA Video Circuitry

The Headland Technologies HT216 VGA controller circuitry on the **MSL486** uses local bus technology to bypass the standard AT bus. By eliminating the need to use the slower 8 MHz bus, the VGA system delivers fast VGA graphics with speeds approaching those of expensive co-processor based add-in cards.

The **HT216-32** has a number of features designed specifically to optimize the graphics performance in Windows and other graphical environments.

Source-Destination Raster Operation

Separate memory and dot clocks (allows the **HT216-32** to handle various tasks simultaneously)

Fast Page Memory Support

FastWrite cache technology (eliminates CPU wait conditions during CPU **writes** to display memory)

Hardware Cursor (provides crisp cursor response in environments such as Windows)

Other features include the capacity to provide up to 1024x768 pixel resolution with 16 colors, both inter-laced and non-interlaced (with 1024 **KB** video memory and a supporting monitor). The circuitry also supports refresh rates up to 76 Hz (with a supporting monitor) to eliminate monitor flicker and reduce eye strain.

Monitor Compatibility

The liT216 works with all fixed and variable-frequency analog monitors compatible with the IBM PS/2 analog monitors. The video resolution you can get from the circuitry depends on the monitor you have. For example, some monitors do not work at resolutions higher than 640x480 because they cannot use the vertical and horizontal scan rates required for higher resolutions. See Section 4 for more information about monitor requirements.

Video **Memory**

The possible video resolutions also depend on how much video memory is installed on the system motherboard. Section 4 explains each resolution and its memory requirements. For information about upgrading the video memory on the system motherboard, see the system User's Guide.

Software Compatibility

The **HT216-32** supports software written for VGA, EGA, CGA, MDA and HGC video standards. Check the software documentation to see what video mode is required by the software.

Chapter 2: Using the VGA Utilities

This chapter explains how to use the utilities on the *SlimLine* *VGA Utilities and Drivers* diskette. These programs allow you to use the extended capabilities of the VGA circuitry.

Note: *The VGA Utilities and the Drivers are all included in one 1.44MB diskette.*

The following programs are included on the diskette:

SETUP.EXE is used to copy the utilities and drivers from the diskette to your local hard drive.

Note: *Most of the files on the diskette are compressed. You must use SETUP.EXE to install these files on the hard drive.*

RAMBIOS.SYS is a device driver that can be loaded in the **CONFIG.SYS** file. When used, **RAMBIOS.SYS** copies VGA BIOS into system memory, allowing programs that use frequent video BIOS calls to run faster.

HTVGA.EXE is the main utility program. It lets you set compatibility modes for the video circuitry, and **lets** you set options for the screen saver included with the program.

DU.COM is a program that displays directory information in as many columns as can be displayed on the screen (regardless of the display mode).

CLR.COM is a program the clears the entire screen when in extended text modes (unlike the DOS command, **CLS,** which works well only in standard text mode).

ESU.COM is a menu driven program for selecting text and graphics modes.

HTDIAG.EXE is a diagnostic program that helps you detect problems with the video circuitry.

ALTPARM.EXE provides display parameters in addi-tion to those included in the VGA BIOS.

HTVESA.COM provides support for the VESA BIOS Extensions **(VBE)** standard.

The following sub-sections explain each program and driver in detail. The instructions assume that you know basic MS-DOS commands. See your *MS-DOS User's Guide* for information about MS-DOS commands.

SETUP.EXE

SETUP.EXE is a menu-driven program that allows you to select the utility programs and software drivers you want to install on the hard drive. SETUP can only be run from a diskette, and it can copy files either to the hard drive or to a diskette.

Note: *The* tiles *on the diskette are compressed.* **You** *must us8 SETUP.EXE to install the files on the hard drive.*

The following steps explain how to run **SETUP.EXE** from the diskette drive:

1. Insert the *SlimLine VGA Utilities and Drivers* diskette into the diskette drive and make the diskette drive the default drive.
2. Run SETUP from the diskette; type SETUP and press **ENTER** at the system prompt. You should see the following screen:

The options available in the **SETUP** program are ex-plained below:

Load RAMBIOS.SYS In CONFIG.SYS installs RAM-BIOS.SYS in your CONFIG.SYS file. See **RAM-**BIOS.SYS later in this section.

Utilitier lets you install the utilities described in this section.

The other selections let you install the extended video drivers for the listed software packages. You can select which display resolution you would like to install for the listed software packages. Refer to Section 3 of this guide for more information.

Exit Installation returns you to a DOS prompt.

Installing the Utilities

Use the SETUP program to install the VGA Utilities on the hard drive.

1. From the SETUP menu, use the UP and DOWN arrow keys to highlight **Utilities. Press** ENTER to select it.
2. Follow the directions on the screen to install the utilities on the hard drive. You can choose the drive and/or directory where to install the files.

RAMBIOS.SYS

RAMBIOS.SYS is a device driver that is loaded in the CONFIG.SYS file. It copies the VGA video BIOS into system memory. This speeds up programs that use frequent video BIOS calls.

Install **RAMBIOS.SYS** by running the SETUP program and choosing **Setup RAMBIOS** from the menu. Follow the directions that appear on the screen to complete the installation. The following line is inserted in the CONFIG.SYS file:

DEVICE=\pathname\RAMBIOS.SYS

If you do not already have a **CONFIG.SYS** file, one will be created.

After you have installed **RAMBIOS.SYS,** exit to a DOS prompt, and re-boot the system to have **RAM-BIOS.SYS** take effect.

*Note: **RAMBIOS.SYS** uses approximately 24 KB of memory. **If** your software applications require large amounts of memory, or if you use memory resident programs, you may fun out of system memory. If this occurs, you may need to remove the **DEVICE=RAM-BIOS.SYS** line from the CONFIGSYS file. See the MS-DOS User's Guide if you need instructions to edit the **CONFIG.SYS** file.*

HTVGA.EXE

HIVGA.EXE is a menu-driven program that allows you to set monitor type, compatibility modes and screen saver options.

***Note:** Since **HTVGA.EXE** can change the display mode, do not run it from within a DOS shell or other graphical user interface (windows, GEM, etc.).*

Follow these steps to use HIVGA:

1. Make the directory in which you installed the Utilities the default directory.
2. Type **HTVGA** and press ENTER. *The* **HTVGA** menu appears.
3. Follow the directions that appear on the screen to select an option.

The options available in **HTVGA.EXE** are detailed here:

Help explains how to use the program.

About displays the current system configuration.

Select Monitor lets you select the type of monitor (color or monochrome) the system is using. You must select a monitor type before you select an emulation mode (see below). Select color if you intend to enable CGA mode, or monochrome for Hercules mode.

Select Emulation Mode enables or disables CGA or Hercules (HGC) modes (required by some software packages).

Note: You *must select a monitor type before you select an emulation mode (see above). Select co/or for CGA mode, or monochrome for Hercules mode.*

Screen Saver lets you enable or disable the screen saver included with the utilities.

Because the screen saver relies on signals from the keyboard, it is not recommended to use the screen saver if you use the following kinds of software: software that uses a mouse more extensively than the keyboard, Microsoft Windows, games or other applications that use a joystick.

If you are using the screen saver and the screen goes blank while you are using the keyboard, or striking a key does not return an image to the screen after it has gone blank, then try the following: restore the screen by pressing the NUM LOCK key, exit the program (ii possible), or reboot the system. Disable the screen saver and run the program again.

Pure Mode enables or disables the VGA extended modes. If Pure VGA mode is enabled, all VGA extensions are disabled.

Exit Installation returns you to a DOS prompt.

Bypassing the HIVGA Menu

You can set HIVGA options on the command line without going through the HTVGA menu. For example, to enable CGA mode, type HTVGA CGA:ON from the

Version D01

Utilities sub-directory and press ENTER. The following explains each of the options you can set at the command line.

HTVGA **CGA:ON** enables CGA compatibility mode.

HTVGA CGA:LOCK enables CGA compatibility mode which will remain in effect through one warm boot (CTRL+ALT+DEL), allowing the use of self-booting CGA programs.

HTVGA CGA:OFF disables CGA compatibility mode.

HTVGA MONO:ON enables HGC compatibility mode.

HTVGA MONO:LOCK enables HGC compatibility mode which will remain in effect through one warm boot (CTRL+ALT+DEL).

HIVGA MONO:OFF disables HGC compatibility mode.

HTVGA MONO:FULL enables 64 **KB** (two-page) HGC compatibility.

HTVGA MONO:HALF enables 32 KB (one-page) HGC compatibility.

HTVGA PURE:ON configures the VGA for only pure IBM VGA standard modes; it disables all extended modes.

HTVGA PURE:OFF enables all VGA extended modes.

HTVGA SAVE:ON enables the screen saver; it blanks the screen when there has been no keyboard activity for **5** minutes.

HTVGA **SAVE:[n]** lets you change the number of minutes before the screen saver blanks the display (where *n* is the number of minutes from 1 to 99).

HTVGA SAVE:OFF disables the screen saver.

HTVGA **NOSAVE** disables the screen saver.

DU.COM

DU.COM is a directory listing utility that displays directory information in as many columns as the screen can accommodate. It can be used in any mode and can display from 50 to 129 entries at a time (as opposed to the 25 entries available through the MS-DOS DIR command).

To use DU.COM, make the directory in which you installed the Utilities the default directory. If you have not installed the Utilities, follow the directions earlier in this section. Type DU and press ENTER.

If you want to be able to use DU.COM from any directory without specifying the full path and filename, include the Utilities sub-directory in the search path. See the *MS-DOS User's Guide* for information on the search path.

DU.COM is used like the DOS DIR command. At the system prompt, type DU and press ENTER. This will display a list of all tiles in the current directory. To stop the display and return to a system prompt, press ESC. To pause the display, press any key other than ESC; to resume it, press any key other than ESC.

Any wildcards that you can use in the DIR command can be used with DU.COM. The following examples show how to use the DU command, and its options (the examples assume that DU.COM's directory is in the search path):

To display all files in a directory other than the current directory, specify the full DOS directory name and use wildcards. For example:

DU \MYFILE*.*
DU \MYFILE\LETTERS*.*

To display only certain files in a directory, specify multiple search strings on the command line by including the file names and/or extensions. For example:

DU letter.* **ltr*.txt**
DU \MY **FILE*.** exe ***.com**

To display only sub-directories, use the **/d** option. For example:

DU/d

To display all files including hidden files, use the **/h** option. For example:

DU/h

To display all files including system files, use the **/s** option. For example:

DU/s

CLR.COM

CLR.COM is an enhanced mode clear screen utility; it clears the entire screen in any text mode. It is used in place of the DOS **CLS** command, which only clears the portion of the screen used by standard modes.

To use **CLR.COM,** make the directory in which you installed the Utilities the default directory. If you have not installed the Utilities, follow the directions earlier in this section. Type **CLR** and press ENTER.

If you want to be able to use **CLR.COM** from any directory without specifying the full path and filename, include the Utilities sub-directory in the search path. See the *MS-DOS User's Guide* for more information about the search path.

ESU.COM

ESU.COM is an enhancement selection utility that allows you to change text and graphics modes through a menu-driven program.

CAUTION: *Do not attempt to set a text or graphics mode that your monitor cannot support. See Chapter* 4 for *monitor requirements.*

Follow these instructions to use ESU.COM:

1. Make the Utilities sub-directory the default directory. If you have not installed the Utiliies, follow the directions earlier in this section.
2. At the system prompt, type ESU and press ENTER. *You see* the ESU menu.
3. Select the text or graphics mode you want from the list on the screen (use the UP and DOWN arrow keys).

You can bypass the ESU menu and set text and graphics modes from the system prompt. For example, from the Utilities sub-directory, type ESU */mode* and press ENTER, where *mode* is the text or graphics mode you want to set.

See Chapter 4 for a list of text and graphics modes.

HTDIAG.EXE

HTDIAG.EXE is a diagnostics program that helps you detect any problems with the VGA circuitry.

*Note: Since **HTDIAG** is not compressed, it can be run directly from the diskette.*

To run **HTDIAG.EXE** from diskette, do the following:

1. Insert the *SlimLine* *VGA Utilities and Drivers* diskette into the drive.

2. If the diskette is in drive A, type **A:HTDIAG** and press ENTER. If the diskette is in drive **B,** type **B:HTDIAG** and press **ENTER.**

3. The program displays the amount of video memory, the VGA BIOS version, any switch settings, any co-resident graphics adapter, and any memory locations used by other devices. You are asked for the type of monitor connected to the system. This determines which resolutions, attributes and capabilities the diagnostics program will test.

4. Use the UP and DOWN arrow keys to select which of the tests you want to run.

ALTPARM.EXE

ALTPARM.EXE is a menu driven program that allows you to load a monitor-specific parameter file, customize the size and/or position of the display (and save it to a user-defined parameter file), and use the best refresh rates on compatible monitors.

Monitor-specific parameter files are provided for a number of variable frequency monitors. Other parameter tables enable the VGA controller to display resolutions at refresh rates of 70 Hz, 72 Hz and 76 Hz (for compatible monitors). See Chapter 4 for monitor requirements.

Also included is the **56HZ600.ALT file,** which provides 800x600 resolution parameters for monitors which display this resolution at 35 KHz horizontal and 56 Hz vertical frequencies (such as the Sony Multiscan 1202 and the NEC **MultiSync** II and **MultiSync** 2A).

Follow these steps to use ALTPARM:

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1. Make the Utilities sub-directory the default directory. If you have not installed the Utilities, follow the directions earlier in this section.

2. Type **ALTPARM** and press **ENTER.** The ALTPARM menu appears.

3. Highlight an option by using the ᴜᴘ and **DOWN** arrow keys. Press **ENTER** to make a selection.

The following explains all the available options using ALTPARM:

Change Screen Parameters lets you select which extended text and/or graphics modes of the current parameter file you want to modify. Follow the instructions on the screen to position or size the **display.**

Load Parameter **File** lets you select the parameter file (either custom or default) that you want to modify.

Save Parameter File lets you save a customized parameter table. The file is automatically saved with .ALT as the extension. Be careful when modifying and saving parameter tables; do not write over existing files that you want to keep.

Restore Old Parameters lets you restore the default settings of the current parameter table provided you have not used the Save Parameter File option.

Exit Program returns you to a system prompt.

You can bypass the ALTPARM menu and load a parameter file at the system prompt. Follow these directions:

1. Make the Utilities sub-directory the default directory.

2. Type ALTPARM *filename* and press ᴇɴᴛᴇʀ, where *filename* is the name of the parameter file you want to load.

VESA1K70.ALT

HTVESA.COM

HTVESA.COM is a Terminate-and-Stay-Resident (TSR) program that provides support for the Video Electronics Standards Association **(VESA)** BIOS extensions standard. **HTVESA.COM** allows you to run software that provides a VESA driver in an extended VGA mode, such as **800x600** with 16 colors.

You must run HTVESA.COM before running software which supports the VESA standard.

Follow these steps to use **HTVESA.COM:**

1. Make the Utilties sub-directory the default directory. If you have not installed the Utilities, follow the directions earlier in this section.

2. To enable VESA compatibility for software that requires only one video memory window, type HTVESA **/1** and press **ENTER.**

   To enable VESA compatibility for software that requires two video memory windows, type HTVESA **/2** and press ENTER.

3. After loading HTVESA, run the software. **HTVESA.COM** remains resident in memory until you reboot the system.

Chapter 3: Using the VGA Drivers

This chapter explains how to install VGA drivers for several software packages. These drivers allow the software to be displayed in extended graphics resolutions, more colors, or extended text modes.

The following software VGA drivers are included:

• **AutoCAD** and **AutoShade**

• **Cadvance**

. Lotus l-2-3 and Symphony

• GEM/3

. Generic **CADD**

• P-CAD

. Presentation Manager

. Ventura Publisher

. **VersaCAD** Design

• Windows

• Word

• WordPerfect

Installing Software Drivers

You must run the SETUP program from the floppy drive (described in Section 2) to install most of the software drivers. SETUP decompresses the drivers and copies them to the appropriate sub-directories of the hard drive.

Note: Make sure your monitor supports the resolution for the driver you want to install. Fixed frequency analog monitors do not support resolutions beyond 640x480. See Section 4 for monitor requirements.

You may need to run **ALTPARM** to adjust the horizontal and vertical size and position controls when using extended resolution modes.

To use **SETUP** to copy the driver to the correct directory, follow these instructions:

1. Run the **SETUP** program. See Section 3 for instructions on running **SETUP.**

2. Use the UP and DOWN ARROW keys to highlight the software drivers you want to install and press ENTER.

3. You see a list of the resolutions supported for the software. Select the resolution you want to install by highlighting the selection and pressing the SPACE **BAR.**

4. After making the selections, press ENTER to decompress the files. You can choose the directories in which to copy the files, or you can accept the defaults provided by **SETUP.**

5. When the process is complete, you see the message, 'Type any key to continue." Press **ESC** to exit to a DOS prompt or any key to return to the selection menu.

8. You can install other software drivers, or return to a system prompt by choosing **Exit Installation**.

After you have decompressed the driver, you can configure the software to display the new resolution. See the sub-section that covers your software.

Installing VGA Drivers for AutoCAD

Drivers are provided for AutoCAD release 9, 10, and 11 (in real mode) and release 10/386 and 11 (in protected mode).

Installing Drivers for AutoCAD in Real Mode

The real mode AutoCAD driver includes one AutoCAD ADI display driver and an installation program. The installation program lets you do the following:

Change the currently selected resolution of Auto-CAD's graphics screen.

Modify the software interrupt vector used by AutoCAD to communicate with the ADI display driver.

Modify the colors used in several areas of the Auto-CAD graphics screen.

Loading the ADI Driver

Before you can work in AutoCAD, you must load the ADI driver into system memory. When you installed the AutoCAD VGA drivers, the file VGAREL1 1 .COM was also copied to the directory you specified as the AutoCAD sub-directory. To install the ADI driver, make the AutoCAD sub-directory the default and type VGAREL11 and press ENTER at the system prompt.

This loads the ADI driver into memory. The driver displays the identification information on the screen, and confirms that it has been installed. It also tells you which interrupt vector will be used to communicate with AutoCAD.

Note: The VGA REL 11. COM driver supports ADI version 4.0; it supports Fast Vector mode and Packet modes, and can also be used with AutoShade and AutoSketch.

Configuring AutoCAD for the ADI Driver

The first time you use AutoCAD with the new driver, you must set the configuration for the ADI General Display Driver. This only needs to be done once, because AutoCAD remembers the configuration.

Follow these steps to configure AutoCAD:

1. **Start AutoCAD.**
2. Select Configure **AutoCAD** from the main menu.
3. After reviewing the current configuration, press **ENTER.**
4. Select Configure **Video Display and** press **Y** to select **Different Video Display.**
5. **Press** 1 to choose ADI.
6. **AutoCAD** asks you some questions about the configuration. See the *AutoCAD Installation and Performance Guide* for information about these questions.
7. When you have answered all the questions, press Y to save the configuration.

Controlling Resolution and Colors

The real mode **AutoCAD** driver includes an installation program called VGAINST which lets you choose different screen resolutions, colors, and interrupt vectors.

Note: VGAINST was installed from the SETUP program when you selected the AutoCAD drivers.

Follow these steps to use VGAINST:

1. Make the **AutoCAD** sub-directory the **default** directory.
2. Type VGAINST **at** the system prompt and press **ENTER.**
3. You are asked several questions. Accept the default responses (in brackets) by pressing **ENTER,** or type in your own responses.
4. Enter the name of the driver you want to modify. The default is **VGAREL1 1 .COM.** Press **ENTER** to accept the default.

*Nob: You may want to create several different versions of the driver to support different resolutions or colors. Copy the VGAREL 11. COM **file** to a file with a different name, then modify it to the desired settings.*

5. You are asked for an interrupt vector number. Use the default (7A) for most installations.
6. Select **Configure AutoCAD resolution to** change the display resolution in **AutoCAD.** Select a resolution from the list on the screen.

Note: The resolution you can select depends on the type of monitor and/or video memory configuration. See Chapter 4 for details.

7. Select **Configure AutoShade rendering resolution** to change the display resolution and number of colors in **AutoShade.** Select **a** resolution from the list on the screen.

Note: *The* resolution you *can select* depends *on the type of* monitor and/or *video memory* configuration. See *Chapter* 4 *for details.*

> *8.* Select the **AutoCAD color mode;** either Release 9 or Release 10 (for both 10 and 11).
> 9. Select **Configuration Data. You** can change the number of command lines, the screen colors, the palette colors or the color settings, or you can use the default settings.

Note: If *you want to* ***modify*** *the palette colors, you must enter the new palette colors in hexadecimal notation.*

Installing Drivers for AutoCAD In Protected Mode

Follow these steps to configure AutoCAD:

> 1. Start AutoCAD.
> 2. Select **Configure AutoCAD** from the main menu.
> 3. After reviewing the current configuration, press **ENTER**.
> 4. Select **Configure Video Display.**
> 5. Select **ADI P388 4.0/4.1** to install the protected mode driver.
> 6. Select the resolution from the menu. The resolution you can select depends on the type of monitor and/or video memory configuration. See Chapter **4** for details.
> 7. Select either the 16 or 256 color driver and set the background color.
> 6. Follow the instructions on the screen to complete and save the changes to the AutoCAD configuration.

Installing VGA Drivers for **Cadvance**

VGA drivers are provided for **Cadvance** versions 3.0 and 3.5. Follow these steps to install the **Cadvance** VGA drivers.

1. Make sure you have copied the drivers by using the SETUP program (see the instructions in the beginning of this section).

2. Make the **Cadvance** directory the default directory.

3. Change the name of the default driver, **GS.DRV**, to GS.OLD. Use the REN command. For example, type REN **GS.DRV GS.OLD** and press **ENTER.**

4. Make the new driver the default. For 800x600 resolution, type REN **GS800.DRV GS.DRV** and press ᴇɴᴛᴇʀ. For 1024x768 resolution, type REN **GS1024.DRV** GS.DRV and press **ENTER.**

5. Start Cadvance.

Installing VGA Drivers for GEM/3

Drivers are provided for GEM/3 versions 3.0 and **3.1.** *You* do not need to use the SETUP program to decompress the drivers.

Noh: **If** *GEM/3 is already installed on your system, skip to step 7.*

Follow these steps to install the **GEM/3** VGA drivers:

1. Put the **GEM/3** System Master Diskette in the diskette drive.

2. Make the diskette drive the default drive.

3. At the system prompt, type **GEMSETUP** and press **ENTER.**

4. **Select Install New Configuration.**

5. When asked for the Graphics Card and Display Installed, select IBM 16 Color VGA if you have a color VGA display, or IBM VGA **Monochrome** if you have a monochrome VGA display.

6. Complete the setup according to the instructions.

7. After GEM/3 is installed, insert the GEM/3 System Master Disk in the diskette drive.

8. Make the diskette drive the default drive.

9. At the system prompt, type **GEMSETUP** and press **ENTER.**

10. Select Change Existing Configuration.

11. Your current configuration is displayed. Select **Continue.**

12. Select Change Your Current Setup.

13. Select the graphics card and display you previously installed.

14. Select Other (Driver Pack) to install the new driver.

15. You are asked to insert the GEM Driver Pack Disk. Insert the MSL486 *Slimline Drivers and Utilities* diskette into the drive and select **Continue.**

17. Select the mode you want to install.

18. Select **Save and Exit.**

Installing VGA Drivers for Generic CAD

VGA drivers for Generic CAD Level 3 are included.

Follow these steps to install the Generic CAD VGA drivers:

1. Make sure you have used the SETUP program to copy the drivers to the Generic CADD sub-directory.

2. Make the Generic CADD sub-directory the default directory.

3. Run the Generic **CADD CONFIG** program. Type **CONFIG** and press ENTER at the system prompt.

4. Choose option **#60 - other** VGD files and press return. Follow the on-screen prompts.

5. Exit **CONFIG** and run Generic **CADD.**

Installing VGA Drivers for Lotus 1-2-3 and Symphony

Drivers are provided for Lotus l-2-3 versions 2.X and Symphony version 1.2.

Follow these steps to install the l-2-3 **and/or** Symphony VGA drivers:

1. Make sure you have used the SETUP program to copy the drivers to the l-2-3 and/or Symphony sub-directory.

2. Insert the i-2-3 or Symphony Utility diskette in the diskette drive.

3. Make the diskette drive the default drive.

4. Go to the LOTUS/Symphony sub-directory and type **INSTALL,** press enter.

5. Follow the directions on the screen to get to the Main Menu.

6. Select the **Change Selected Equipment** option.

7. At the **Change Selected Equipment** options menu select **Modify the Current Driver Setup option.**

8. **Select Graphics Display.**

9. **From the list of available drivers, select the driver that you want to install.**

10. **Select Modify Current Driver Set.**

11. Select **Graphics Display.**

12. From the list of available drivers, select the driver you want to install.

13. Select **Save Changer.**

14. Follow the instructions on the screen to name the new driver set or make it the default driver set and complete the installation.

Installing VGA Drivers for P-CAD

VGA drivers are included for P-CAD versions 3.0, 4.0 and 5.0. Follow these steps to install the driver:

1. install P-CAD, and choose **IBM VGA as the** display adapter.

2. Make sure you have used the SETUP program to copy the P-CAD drivers to the PCAD Driver sub-directory (usually called **PCAD\DRV).**

3. Use a text editor to modify the P-CAD configuration file **PCADDRV.SYS.** Replace **DIBMVGA.DRV** with the name of the file for the resolution you want. in otherwords, instead of loading the **DIBMVGA.DRV,** load one of the files from the list below:

    DPCAD640.DRV 640x480 by 16 colors
    DPCAD720.DRV720x540 by **16** colors
    DPCAD800.DRV800x600 by 16 coiorr
    DPCAD1K.DRV1024x768 by 16 colors

4. Reboot the system **for** the changes to take effect,

Installing VGA Drivers for Presentation Manager

VGA drivers are included for Presentation Manager version 1.2. Follow the steps bellow to install the Presentation Manager VGA drivers:

1. From the OS/2 DOS Compatibility Box, run the SETUP program to copy the Presentation Manager driver and monitor files to the **OS2\DLL** sub-directory.

2. Re-boot the system with the OS/2 Installation Disk. When asked to press **RETURN** to continue, or **ESC** to cancel, press ESC.

3. Change the display resolution by renaming the default file and copying over the new file. First, rename **DISPLAY.DLL** to **DISPLAY.OLD.** Type REN **DISPLAY.DLL DISPLAY.OLD** and press **ENTER.**

    Next, change the name of the new file to **DISPLAY.DLL.** Type COPY **VGA*xxxx*.DLL DISPLAY.DLL** and press ENTER (where **VGA*xxxx*.DLL** is the name of the new display driver).

4. Change the monitor driver file by renaming the default file and copying over the new file. First, rename **MONITOR.DLL** to MONITOROLD. Type REN **MONITOR.DLL MONITOR.OLD** and press ENTER.

    Next, change the name of the new file to **MONITOR.DLL.** Type COPY **MON*xxxx*.DLL MONITOR.DLL** and press ENTER (where **MON*xxxx*.DLL** is the name of the new monitor diver).

Note: *If a MONITOR. DLL file does not currently exist in the **OS2\DLL** sub-directory, simply rename **the** appropriate new monitor filename to MONITOR. DLL.*

5. Re-boot the system for the changes to take effect.

Note: *Make sure the line IOPL=yes is in the CON-FIG. SYS file.*

Installing VGA Drivers for Ventura Publisher

VGA drivers are included for Ventura Publisher versions 2.0 and 3.0. Follow these steps to install the Ventura VGA drivers:

Note: It is not necessary to use the SETUP program to install the drivers.

1. Install Ventura Publisher as described in the software documentation. Select the VGA **display device driver.**
2. Insert the *SlimLine ZXP VGA Drivers* diskette into the diskette drive.
3. Make the diskette drive the default drive.
4. At the system prompt, type **VPINST_2** and press **ENTER.**
5. Follow the directions on the screen to install the driver.

Installing VGA Drivers for VersaCAD Design

VGA drivers are included for VersaCAD Design versions 5.3, 5.4 and **VersaCAD/386.** The VersaCAD drivers consist of a resolution file and a configuration file. **VCAD53.CFG** is the configuration file for **Versa**-CAD Design 5.3; **VCAD54.CFG** is for VersaCAD Design 5.4; **VCAD386.CFG** is for **VersaCAD/386.**

Follow these steps to install the VersaCAD Design VGA drivers:

1. Make sure you have used the SETUP program to copy the VersaCAD driver and configuration

files to the VersaCAD subdirectory. See the beginning of this section for instructions.

2. Use a text editor to modify the VersaCAD batch file (usually in the root directory of the hard drive) to include the driver name of the resolution you've selected. Change the VCAD line (usually the second line in the batch file) to include the name of the resolution **driver** you want to load. See the list on the following **page.**

   VCAD800.EXE640x480 by 16 **colors**
   720x540 by 16 colors
   800x600 by 16 colors
   VCAD1024. EXE1 024x768 by 16 colors
   VCAD1KP.EXE1024x768 by 16 color8 (for **VersaCAD/386).**

   For example, if you have loaded the **VCAD800** driver for VersaCAD Design version 5.3, the batch tile would look like this:

   CD **\VCAD53**
   VCAD800
   VRUN

3. Make the VersaCAD directory the default directory and start VersaCAD.

4. Press E to change the screen configuration, and select the resolution you want.

Installing VGA Drivers for Microsoft Windows

VGA drivers are included for Windows versions 3.0 and 3.1. Windows applications will be displayed at the resolution you choose when installing Windows or changing the display configuration.

Follow these steps to install the Windows VGA drivers:

1. If you have not already **done so, install Windows and choose** VGA **as the display option.**

2. Make sure you have used the SETUP program to copy the Windows drivers to the WINDOWS\SYSTEM sub-directory.

3. Start Windows.

4. Select **File Run** to run HTSETUP from the WINDOWS\SYSTEM sub-directory (or from whatever sub-directory where the system files are located) or simply double-click on the VGA SETUP icon.

5. When asked for the path to the Windows drivers, type C:\WINDOWS\SYSTEM (or whatever sub-directory where the system files are located) and follow the on-screen prompts.

6. You are asked to select the resolution you want to display. If a resolution is not supported (because of the amount of video memory Installed) then that choice appears grayed out. Select the resolution you want.

Note: If you *choose a 1024x768 resolution, you have the option to choose large or small fonts. Large fonts are recommended for easier reading.*

7. Exit and restart Windows for the changes to take effect

Note: *If you are running Windows in 386 Enhanced mode, the file VDDVGA.386 will be used. V7SETUP will modify the SYSTEM.INI file to use this driver, but you may need to have the windows installation diskettes available to complete this step.*

Installing VGA Drivers for Microsoft Word

VGA drivers are included for Word versions 5.0 and 5.5. Follow these steps to install the Word VGA drivers:

1. Make the Word sub-directory the default directory.

2. Rename the **SCREEN.VID** file in the Word sub-directory to SCREEN.OLD. Type REN **SCREEN.VID** SCREEN.OLD and press ENTER.

3. Make sure you have used the SETUP program to copy the Word driver files **(SCREEN.VID** and VIDSETUP.EXE) to the Word sub-directory.

4. At the system prompt, type VIDSETUP and press **ENTER.**

5. Select the resolutions you want to install (use the **INS** and DEL keys).

***Note:** Word automatically uses the highest resolution selected for the Print Preview mode.*

6. Follow the directions on the screen to exit the **VIDSETUP** program.

7. Start Word and use the **Options** command to change the display resolution.

***Note:** Some older versions Of mouse drivers may not work properly in extended text or graphics modes, causing the mouse pointer to disappear of not work beyond the standard 80 columns. If you are using a mouse with Word and have these kinds Of problems, contact the mouse manufacturer for an updated version of the mouse driver.*

Installing VGA Drivers for WordPerfect

VGA graphics drivers are included for WordPerfect version 5.0. VGA text and graphics drivers are included for **WordPerfect** version 5.1. Follow the appropriate steps below.

Installing Graphics Drivers for WordPerfect 5.0

1. Make sure you have used the SETUP program to copy the **WordPerfect** 5.0 **graphics** drivers to **the WP50** sub-directory.

2. Run WordPerfect, and choose the Setup command.

3. From the Setup menu, choose **Display (#3), then select Graphics Screen Type (#5).**

4. Select the resolution you want to use.

5. Follow the directions on the screen to exit the Setup menu.

Installing Graphics/Text Drivers for WordPerfect 5.1

1. Make sure you have used the SETUP program to copy the WordPerfect 5.1 drivers to the **WP51** sub-directory.

2. Run WordPerfect, and choose the Setup command.

3. From the Setup menu, select the text and graphics resolutions you want to use.

4. Follow the directions on the screen to exit the Setup menu.

Chapter **4:** Technical Information

This chapter provides the technical requirements for monitors attached to the **HT216-32** video circuitry. It also explains each extended display mode, and the memory requirements for each display mode.

Monitor Timings for
Extended Graphics Modes

The following tables show the scan rate requirements for extended graphics modes in 512 KB and 1 MB video memory configurations:

512KB and 1 MB Video RAM Configuration

Mode	Resolution	Vertical Scan Rate	Horizontal Scan Rate
60	752x410 by 16 colors	70 Hz	31 .o KHZ
61	720x540 by 16 colors	60 Hz	35.0 KHZ
62	600x600 by 16 colors	60 Hz	**37.9 KHz**
63	1024x766 by 2 colors	43 Hz	35.5 **KHz**
*65	1024x766 by 16 colors	43 Hz	35.5 KHZ
+65	1024x766 by 16 colors	60 Hz	46.5 **KHz**
66	640x400 by 256 colors	70 Hz	31.1 KHZ
67	640x460 by 256 colors	60 Hz	31.5 KHZ
66	**720x540** by 256 colors	60 Hz	35.0 **KHz**
69	600 x 600 by 256 colors	60 Hz	37.9 KHZ

- Interlaced
+Non-interlaced

1 MB Video RAM Configuration *Only*

Mode	Resolution	Vertical Scan Rate	Horizontal Scan Rate
6A*	1024x768 by 256 colors	43 Hz	35.5 KHz
6A+	1024x768 by 256 colors	**60 Hz**	48.5 KHz

*Interlaced
+Non-interlaced

Note: **You** *can use the ALTPARM.EXE utility to customize the display on monitors that have different horizontal and/or vertical scan rates. See Section 2, Chapter 2 for more information about ALTPARM.*

Using Ergonomic Refresh Rates

The VGA controller is capable of displaying many resolutions with a refresh rate (vertical scan rate) of 72 Hz, and can display some modes as high as 78 Hz. These refresh rates eliminate almost all monitor flicker detectable by the human eye. If your monitor is capable of using the higher refresh rates, you can use the ALTPARM utility (described in Section 2, Chapter 2) to change the display mode to one of those listed below.

CAUTION: Do not attempt to set a refresh rate that your monitor is not capable of producing. Check the information that came with your monitor for details.

Mode	Resolution	Vertical Scan Rate	Horizontal Scan Rate
3	80x25 by 16 colors	72 Hz	31.8 KHz
12	640x480 by 16 colors	72 Hz	39.4 KHz
12	640x480 by 16 colors	76 Hz	40.6 KHz
40	80x43 by 16 colors	72 Hz	30.0 KHz
41	132x25 by 16 colors	72Hz	30.0 KHz
42	132x43 by 16 colors	72 Hz	30.0 KHz
43	80x60 by 16 colors	72 Hz	39.4 KHz
44	100x60 by 16 colors	72 Hz	38.3 KHz
61	720x540 by 16 colors	72 Hz	42.8 KHz
62	800x600 by 16 colors	72 Hz	48.1 KHz
62	800x600 by 16 colors	76 Hz	50.4 KHz
65	1024x768 by 16 colors	70 Hz	56.9 KHz
65	1024x766 by 16 colors	72 Hz	62.5 KHz
67	640x480 by 256 colors	72 Hz	39.4 KHz
68	720x540 by 256 colors	72 Hz	42.8 KHz
69	800x600 by 256 colors	72 Hz	48.1 KHz
6A	1024x768 by 256 colors	70 Hz	56.9 KHz
6A	1024x768 by 256 colors	72 Hz	62.5 KHz

Reference to Text and Graphics Modes

The following **table lists the available text and graphics modes, the resolution, the kind of monitor required and whether the mode is for text or graphics. Note the following abbreviations used in the table below:**

ADFixed-Frequency Analog Display
VFDVariable-Frequency Display
IDInterlaced Display
HVFHigh-Resolution VFD

Mode	Resolution	Monitor Type Supported	Mode Type
0,1	40x25 by 16 colors	VFD, AD	Text
2, 3	80x25 by 16 colors	VFD, AD	Text
4,5	320x200 by 4 colors	VFD, AD	Graphics
6	640x200 by 2 colors	VFD, AD	Graphics
7	80x25 by 4 colors	VFD, AD	Text
D	320x200 by 16 colors	VFD, AD	Graphics
E	640x200 by 16 colors	VFD, AD	Graphics
F	640x350 by 4 colors	VFD, AD	Graphics
10	640x350 by 16 colors	VFD, AD	Graphics
11	640x480 by 2 colors	VFD, AD	Graphics
12	640x480 by 16 colors	VFD, AD	Graphics
13	320x200 by 256 colors	VFD, AD	Graphics
40	80x43 by 16 colors	VFD, AD	Text
41	132x25 by 16 colors	VFD, AD	Text

Mode	Resolution	Monitor Type Supported	Mode Type
42	132x43 by 16 colors	VFD,AD	Text
43	60x60 by 16 colors	VFD,AD	Text
44	100x60 by 16 colors	VFD,AD	Text
45	132x28 by 16 colors	VFD,AD	Text
60	752x410 by 16 colors	VFD	Graphics
61	720x540 by 16 colors	VFD	Graphics
62	800x600 by 16 colors	VFD	Graphics
6 3	1024x768 by 2 colors	ID	Graphics
65*	1024x768 by 16 colors	ID	Graphics
65+	1024x768 by 16 colors	HVF	Graphics
66	640x400 by 256 colors	VFD, AD	Graphics
67	640x480 by 256 colors	VFD,AD	Graphics
68	720x540 by 256 colors	VFD	Graphics
69	800x600 by 256 colors	VFD	Graphics
6A[1]	1024x768 by 256 colors	ID	Graphics
6A[1]	1024x768 by 256 colors	HVF	Graphics

*Interlaced
+Non-interlaced
[1] 1 MB Video Memory required