ICS
A D V E N T™

Model SB486PV
Product Manual

MANUAL NUMBER : 00431-013-7C

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Mission Critical Applied Computing Solutions

FOREWORD

This product manual provides information to install, operate and/or program the referenced product(s) manufactured or distributed by ICS Advent. The following pages contain information regarding the warranty and repair policies.

Check our Web site (*http://www.icsadvent.com/techsupport*) for technical information, manual, and BIOS updates. Technical assistance is also available at: **800-480-0044** (U.S. and Canada) or **858-677-0877** (international).

Manual errors, omissions, bugs, and/or comments: A Customer Comments section is included at the end of this manual. If you experience any problems with the manual or just want to give us some feedback, please review the information in this section. It will tell you how to easily access our web site and provide immediate feedback online.

Guarantee

A thirty day money-back guarantee is provided on all **standard** products sold. **Special order products** are covered by our Limited Warranty, _however they may not be returned for refund or credit._ _EPROMs, RAM, Flash EPROMs or other forms of solid electronic media are not returnable for credit - but for replacement only. Extended Warranty available. Consult factory._

Refunds

In order to receive refund on a product purchase price, the product must not have been damaged by the customer or by the common carrier chosen by the customer to return the goods, and the product must be returned complete (meaning all manuals, software, cables, etc.) within 30 days of receipt and in as-new and resalable condition. The **Return Procedure** must be followed to assure prompt refund.

Restocking Charges

Product returned _after_ 30 days, and _before_ 90 days, of the purchase will be subject to a **minimum** 20% restocking charge and any charges for damaged or missing parts.

Products not returned within 90 days of purchase, or products which are not in as-new and re-saleable condition, are not eligible for credit return and will be returned to the customer.

Limited Warranty

Effective April 1, 1998, all products carry a two-year limited warranty with the exception of the "Performance Series" I/O products, which are warranted to the original purchaser for as long as they own the product, subject to all other conditions below, including those regarding neglect, misuse and acts of God. Within two years of purchase, ICS Advent will repair or replace, at our option, any defective product. At any time after two years, we will repair or replace, at our option, any defective "Performance Series" I/O product sold. This does not include products damaged in shipment, or damaged through customer neglect or misuse. ICS Advent will service the warranty for all standard catalog products for the first two years from the date of shipment. After the second year, for products not manufactured by ICS Advent, the remainder of the manufacturer's warranty, if any, will be serviced by the manufacturer directly.

The **Return Procedure** must be followed to assure repair or replacement. ICS Advent will normally return your replacement or repaired item via Second Day Air. _Overnight delivery or delivery via other carriers is available at additional charge._

The limited warranty is void if the product has been subjected to alteration, neglect, misuse, or abuse; if any repairs have been attempted by anyone other than ICS Advent or its authorized agent; or if the failure is caused by accident, acts of God, or other causes beyond the control of ICS Advent or the manufacturer. Neglect, misuse, and abuse shall include any installation, operation, or maintenance of the product other than in accordance with the owners' manual.

No agent, dealer, distributor, service company, or other party is authorized to change, modify, or extend the terms of this Limited Warranty in any manner whatsoever. ICS Advent reserves the right to make changes or improvements in any product without incurring any obligation to similarly alter products previously purchased.

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Shipments not in compliance with this Guarantee and Limited Warranty Return Policy will not be accepted by ICS Advent.

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Return Procedure

For any Limited Warranty or Guarantee return, please contact ICS Advent's Customer Service at **1-800-480-0044** (U.S. and Canada) or **858-677-0877** (international) and obtain a Return Material Authorization (RMA) Number. All product(s) returned to ICS Advent for service or credit **must** be accompanied by a Return Material Authorization (RMA) Number. Freight on all returned items **must** be prepaid by the customer who is responsible for any loss or damage caused by common carrier in transit. Returns for Warranty **must** include a Failure Report for each unit, by serial number(s), as well as a copy of the original invoice showing date of purchase.

> To reduce risk of damage, returns of product must be in an ICS Advent shipping container. If the original container has been lost or damaged, new shipping containers may be obtained from ICS Advent Customer Service at a nominal cost.

Limitation of Liability

In no event shall ICS Advent be liable for any defect in hardware or software or loss or inadequacy of data of any kind, or for any direct, indirect, incidental, or consequential damages in connection with or arising out of the performance or use of any product furnished hereunder. ICS Advent liability shall in no event exceed the purchase price of the product purchased hereunder. The foregoing limitation of liability shall be equally applicable to any service provided by ICS Advent or its authorized agent.

Some *Sales Items* and *Customized Systems* are **not** subject to the guarantee and limited warranty. However, in these instances any deviations will be disclosed prior to sales and noted in the original invoice. ***ICS Advent reserves the right to refuse returns or credits on software or special order items.***

Advisories

Three types of advisories are used throughout the manual to stress important points or warn of potential hazards to the user or the system. They are the Note, the Caution, and the Warning. Following is an example of each type of advisory:

Note: The note is used to present special instruction, or to provide extra information which may help to simplify the use of the product.

CAUTION!

A Caution is used to alert you to a situation which if ignored may cause injury or damage equipment.

WARNING!

A Warning is used to alert you of a situation which if ignored will cause serious injury.

Cautions and Warnings are accented with triangular symbols. The exclamation symbol is used in all cautions and warnings to help alert you to the important instructions. The lightning flash symbol is used on the left hand side of a caution or a warning if the advisory relates to the presence of voltage which may be of sufficient magnitude to cause electrical shock.

Use caution when servicing any electrical component. We have tried to identify the areas which may pose a Caution or Warning condition in this manual; however, ICS Advent does not claim to have covered all situations which might require the use of a Caution or Warning.

You must refer to the documentation for any component you install into a computer system to ensure proper precautions and procedures are followed.

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Current Revision 7C

July 1999

Chapter 1: Introduction

The SB486PV is a full featured CPU of standard AT form which is designed to plug into an ISA passive backplane. It is a full length card, measuring 13.36" ±0.015" in length from the outside of the rear panel mounting bracket to the card guide end of the PCB, by 4.80" in height. The SB486PV includes all the features of a basic computer system on a single card which makes it both versatile and economical. The board's processor is easily upgraded to accommodate today's and tomorrow's industrial needs.

Features

- 80486SX CPU at 25 and 33MHz operating frequency (CPU Clock Rate)

- 80486DX CPU at 25 and 33MHz operating frequency

- 80486DX2 CPU at 50 and 66MHz operating frequencies (internally doubled)

- 80486DX4 CPU at 75 and 100MHz operating frequencies (internally tripled)

- P24T CPUs

- Up to 64MBytes of DRAM with parity checking via two vertical 72 pin SIMM sockets

- 128K or 512K Cache RAM

- AMI Win BIOS Configuration Program in Flash EPROM

- Watchdog Timer with hardware reset

- Real-time clock with integrated 10 year lithium battery

- PCI On-Board Local Bus (Intel Saturn-2 chip set)

- 2 RS232C serial ports

- 1 Centronics compatible parallel printer port

- Standard AT compatible keyboard port

- PCI Local Bus SVGA video display adapter

- PCI Local Bus IDE fixed disk controller

- Speaker, Keyboard, and Keylock Port

Watch Dog Circuit

The watch dog circuit is a hardware timer that resets the CPU if the timer is not refreshed periodically. The circuit is refreshed by a trigger pulse provided by the BALE bus line. Any event, such as a read or write to memory, disk drive activity, video refresh, etc., will trigger the BALE line and thus reset the timer. If the processor should become hung-up, the watch dog circuit will time out and reset the CPU. The watchdog circuit is set to reset the CPU if it is not refreshed for 150msec or greater. Also, a power monitor, built into the same circuit, is set to reset the CPU if the +5VDC power varies by more than 5%.

How to remain CE Compliant

The SB486PV Series boards are designed to be CE compliant when used in CE compliant chassis. Maintaining CE compliance also requires proper cable and cabling techniques. Although ICS Advent offers accessories, the customer must ensure that these products are installed with proper shielding to maintain CE compliance. ICS Advent does not offer engineering services for designing cabling systems. In addition, ICS Advent will not retest or recertify systems or components that have been reconfigured by customers.

Specifications

General

CPU Speeds

> 25MHz - 80486SX
> 33MHz - 80486SX or 80486DX
> 25/50MHz - 80486DX2
> 33/66MHz - 80486DX2
> 25/75MHz - 80486DX4
> 33/100MHz - 80486DX4
> 63MHz - P24T
> 83MHz - P24T

ISA Bus Speed

> 8.3MHz, 64mA drive current

Power Requirements

> 1.4A @ +5V without CPU or DRAM
> 0.1A @ +12V

Keyboard Interface

> IBM AT Compatible, self-healing fuse

MTBF

77,500 P.O.H. @ 25°C

Agency Approvals

CE Compliance 73/23/EEC, EMC 89/336/EEC

Controllers

Disk Drive

Dual IDE fixed disk, PCI Local Bus
Dual floppy disk

Serial Port

RS232C, 16550 UART compatible with 16 byte FIFO on send and receive

Parallel Port

Centronics compatible; compatible with software "dongles"

Video

Cirrus Logic device controller
SVGA, PCI Local Bus with 1MB VRAM
Resolutions
  640 x 480
  800 x 600
  1024 x 768
Horizontal Sync Siganls
  31.5 - 60KHz
Vertical Refresh
  43 - 75Hz

Note: The SB486PV is permanently set for color monitor applications. Only monochrome VGA monitors, i.e. analog input, can be used for non-color applications.

Drivers are supplied for Windows 3.XX, OS/2, Windows NT 3.5X, and MS-DOS.

All controllers are individually enabled or disabled in the BIOS. The serial COM ports have selectable I/O addresses. The BIOS may be set to permit the CPU to "boot up" with or without a keyboard.

Environmental

Operating Temperature

0°C to 70°C, 5% to 95% R.H., Non-Condensing

Storage Temperature

-40°C to 70°C, 5% to 95% R.H., Non-Condensing

Chapter 2: CPU

The SB486PV can be configured with many different processors to accommodate the various needs of both personal and industrial applications. Any 80486 series processor and even the P24T Pentium will be compatible with this system.

Processor Upgrades

The SB486PV is designed to allow easy upgrades of the processor. The board utilizes a Zero Insertion Force (ZIF) socket for the processor which enables it to be removed and upgraded with very little effort.

CAUTION!

Before removing processor, ensure static electricity has been discharged from yourself and any object that will have contact with the chip. Failure to do so may result in damage to the processor or other components on the board and VOID your warranty.

DO NOT use excessive force to remove or pry cooling fans or heat sinks from the processor. Failure to observe this warning could result in damage to the processor and VOID your warranty.

Procedures

1. Ensure proper static precautions have been taken *before* starting any work and disconnect system power.
2. Gain access to the processor.
3. Take note of the processor orientation and ZIF socket lever position for future reference during this procedure.
4. Remove the old processor. This is accomplished by moving the lever on the ZIF socket out slightly to unlock it and then through a 90 degree rotation. This releases the processor from the socket and allows it to be removed.
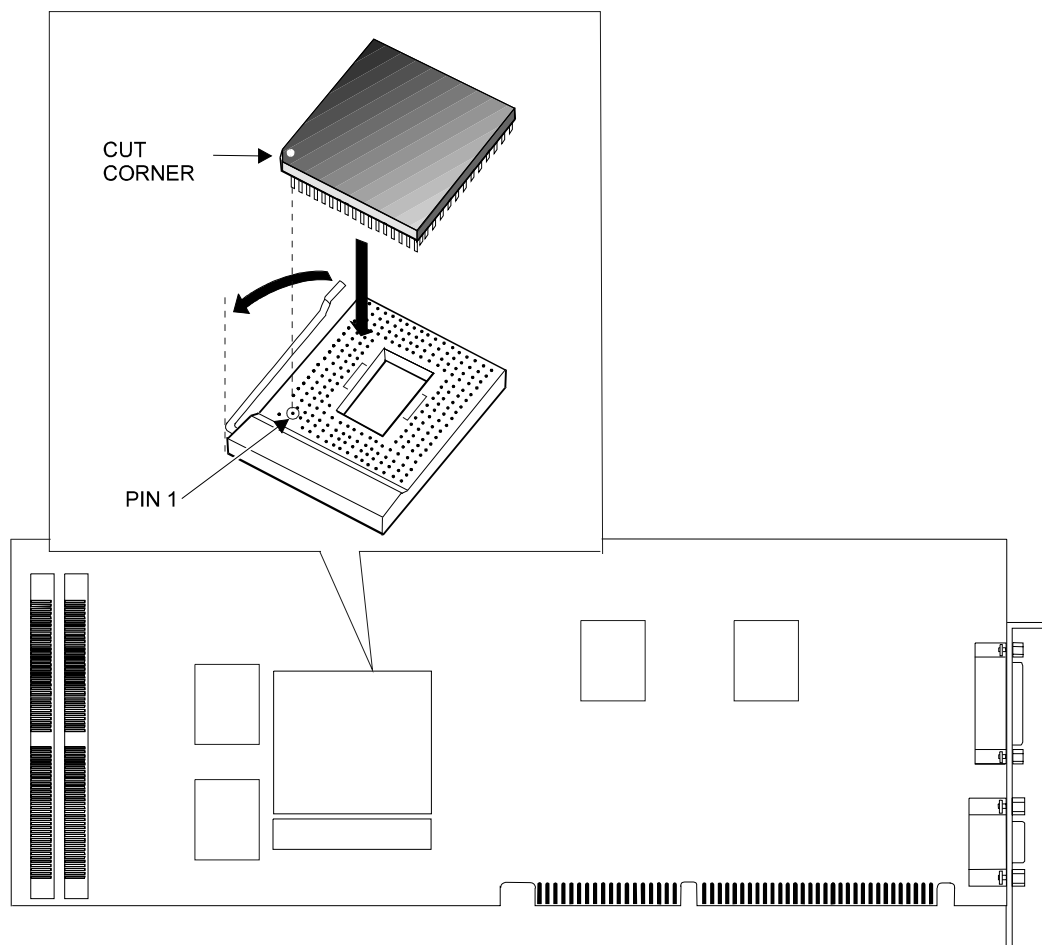
Figure 2-1: Processor Orientation

5. Place new processor into ZIF socket. Ensure proper orientation of the processor by aligning Pin 1, referenced by a cut corner on the processor, with the corner of the ZIF socket that contains the lever. DO NOT force the processor. When properly positioned, it will literally drop into place. Evidence of a processor having been forced into position WILL void your warranty.

6. Place the ZIF socket lever to its original position to lock the processor in place.

7. Set appropriate jumpers listed in Figure 2-1 for your new processor.

Configuration Jumpers

The SB486PV utilizes configuration jumpers to maintain compatibility with the available processors and enable users to erase certain setup parameters, should they so desire. The SB486PV contains six configuration jumpers, labeled JP1 thru JP6. The following tables list each jumper and its respective setting or function.
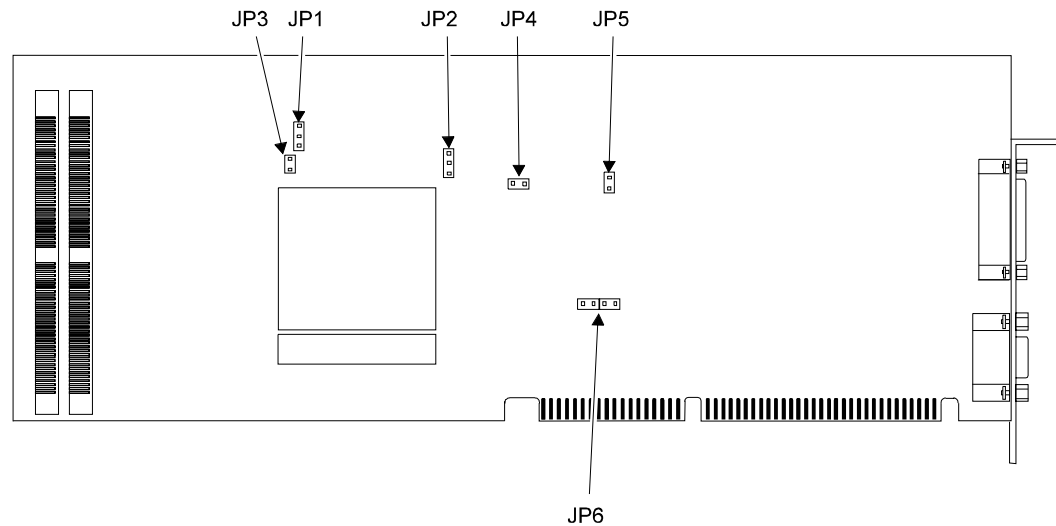
Figure 2-2: Jumper Locations

Table 2-1:   Processor Jumpers

Processor	Jumper Settings			
	JP1	JP2	JP3	JP6
25MHz-486SX	2-3	2-3	installed	2-3
33MHZ-486SX	1-2	2-3	installed	2-3
25MHZ-486DX	2-3	2-3	installed	1-2 & 3-4
33MHZ-486DX	1-2	2-3	installed	1-2 & 3-4
50MHZ-486DX2	2-3	2-3	installed	1-2 & 3-4
66MHZ-486DX2	1-2	2-3	installed	1-2 & 3-4
75MHZ-486DX4	2-3	2-3	installed	1-2 & 3-4
100MHZ-486DX4	1-2	2-3	installed	1-2 & 3-4
63MHZ-P24T	2-3	1-2	NOT INSTALLED	1-2 & 3-4
83MHZ-P24T	1-2	1-2	NOT INSTALLED	1-2 & 3-4

Jumper **JP4** is used to clear the CMOS memory (including the system's password) while **JP5** is used to clear *only* the system's password. To use either of these jumpers, turn power off the system and install the applicable jumper for one power-on cycle.

For **JP4**, a power-on cycle consists of the system starting, completing the memory test, and displaying a CMOS message similar to the following:

```
CMOS System Option Not Set
CMOS Display Type Mismatch
Run Setup Utility
Press F1 to Resume
```

For **JP5**, a power-on cycle consists of the system starting, completing the memory test, and then resetting. The system will continue with this cycle until it is shutdown and only needs to complete the cycle once to clear the password.

After the power-on cycle, turn power off and remove the applicable jumper:

JP4: Clears CMOS memory when installed for one power-on cycle

JP5: Clears the system password when installed for one power-on cycle

Chapter 3: Memory

RAM

The SB486PV allows a maximum of 64MB of 36 bit wide, 0 wait state, on-board memory via two 72 pin SIMM sockets. The memory is configurable in increments of 4, 8, 16, 32, or 64MB. The following table lists the SIMM combinations needed to achieve these values.

Table 3-1: Memory Configuration

Memory	SM1	SM2
4MB	512K x 36 (2MB)	512K x 36 (2MB)
8MB	1MB x 36 (4MB)	1MB x 36 (4MB)
16MB	2MB x 36 (8MB)	2MB x 36 (8MB)
32MB	4MB x 36 (16MB)	4MB x 36 (16MB)
64MB	8MB x 36 (32MB)	8MB x 36 (32MB)

SIMM Installation

The SB486PV uses only **Tinned Lead SIMMs**. It is recommended that 70ns SIMMs or faster be used to ensure reliable operation at 0 wait states.

SIMM sockets are very durable but can be broken. Use extreme care when removing a SIMM from the socket. Never force a SIMM into a socket and make sure the SIMM is in the correct orientation before installation. **Any SIMM sockets broken due to ABUSE, MISHANDLING, or ACCIDENT are not covered under the warranty.**

Procedures

1. Orient the SIMM with the slotted edge (pin 1 side) towards the top edge of the board.
2. Insert the SIMM into the socket at a 45 degree angle (approximately). Make sure the SIMM is completely seated in the socket.
3. Stand the SIMM straight up until it "clicks" into position.

INSERT   STAND UP   LOCK   "CLICK"
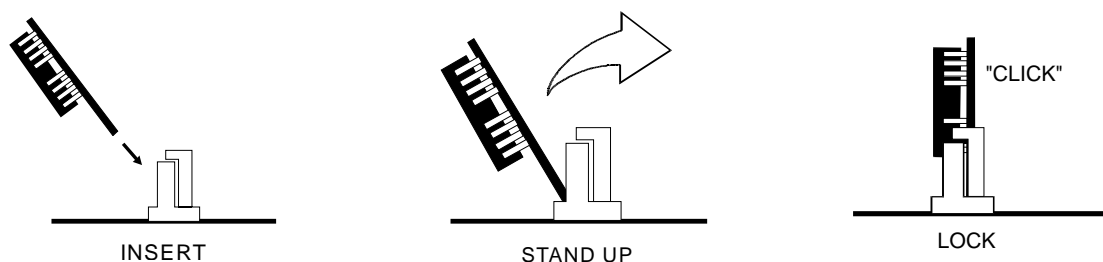
Figure 3-1:   SIMM Installation

Cache

The SB486PV comes standard with 128K **OR** 512K cache memory. This memory can be used in a Write Back or Write Through configuration, depending on the installed processor. Cache size is determined at the time of purchase.

ROM

The BIOS ROM on the processor board is 28F001BX-T (128k X 8). It utilizes FLASH memory to allow for easy reprogramming and upgrades of the BIOS. The SB486PV uses the AMI WinBIOS. Refer to Appendix A for more information on the BIOS and its setup.

Chapter 4: Connectors

The SB486PV has two rear panel and ten on-board connectors. All on-board connectors have "pin 1" identified by a square pad on the PCB and a silkscreened "1" next to the pin to prevent improper connection of system harnesses. All connectors are also silkscreened for function and "J#". All pins supplying current in excess of 1.0A to an external connection are fused for protection.

Rear Panel Connectors

SVGA port

Parallel Printer port

On-Board Connectors

Dual Serial ports

Floppy Drive controller

Hard Disk controller

Hard Disk Active LED

Keyboard

Keyboard Lock

External Reset

Speaker

Fan (+12VDC)
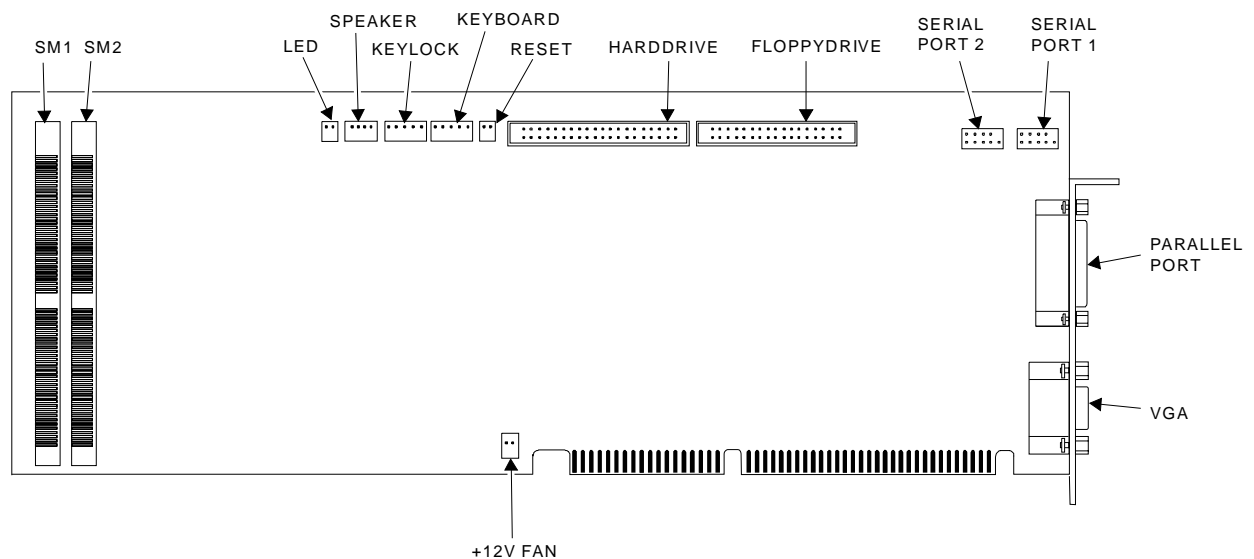
Figure 4-1:   Connector Locations

Connector Pin Assignments

J1 - IDE Hard Drive LED - 2 pin single row header, Molex 22-23-2021

PIN	SIGNAL
1	LED
2	+5V Pullup

J2 - Speaker Port - 4 pin single row header, Molex 22-23-2041

PIN	SIGNAL
1	Speaker Data
2	n/c
3	Gnd
4	+5V

J3 - Keylock - 5 pin single row header, Molex 22-23-2051

PIN	SIGNAL
1	LED Power
2	n/c
3	Gnd
4	Keylock Data
5	Gnd

J4 - Keyboard - 5 pin single row header, Molex 22-23-2051

PIN	SIGNAL
1	Keyboard Clock
2	Keyboard Data
3	n/c
4	Gnd
5	Keyboard Power (+5V fused)

J5 - External Reset - 2 pin header, Molex 22-23-2021

PIN	SIGNAL
1	Negative External Reset
2	Gnd

J6 - IDE Hard Drive - 40 pin dual row header, AMP 2-103328-0

PIN	SIGNAL	PIN	SIGNAL
1	Reset	2	Gnd
3	Data 7	4	Data 8
5	Data 6	6	Data 9
7	Data 5	8	Data 10
9	Data 4	10	Data 11
11	Data 3	12	Data 12
13	Data 2	14	Data 13
15	Data 1	16	Data 14
17	Data 0	18	Data 15
19	Gnd	20	n/c
21	n/c	22	Gnd
23	LOC IOW	24	Gnd
25	LOC IOR	26	Gnd
27	LOC RDY	28	reserved
29	n/c	30	Gnd
31	IRQ 14	32	LOC IOCS16
33	Add 1	34	n/c
35	Add 0	36	Add 2
37	CS 0	38	CS 1
39	LED	40	Gnd

J7 - Floppy Drive Connector - 34 pin dual row header, AMP 1-103328-7

PIN	SIGNAL	PIN	SIGNAL (*)
1	Gnd	2	DRVEN 0
3	Gnd	4	n/c
5	Gnd	6	DRVEN 1
7	Gnd	8	Index#
9	Gnd	10	FDME 0#
11	Gnd	12	FDSel 1#
13	Gnd	14	FDSel 0#
15	Gnd	16	FDME 1#
17	Gnd	18	Dir#
19	Gnd	20	Step#
21	Gnd	22	WRData#
23	Gnd	24	WRGate#
25	Gnd	26	TRK 0#
27	Gnd	28	WRProtect#
29	Gnd	30	RDData#
31	Gnd	32	HDSEL #
33	Gnd	34	DSKCHG#

(*) the "#" after a signal indicates negative true versus positive true.

J8 - Serial Port 2 - 10 pin dual row header, AMP 103328-5

PIN	SIGNAL	PIN	SIGNAL
1	Carrier Detect	2	Data Set Ready-I
3	Receive Data-I	4	Request to Send-O
5	Transmit Data-O	6	Clear to Send-I
7	Data Terminal RDY-O	8	Ring Indicator-I
9	Signal Gnd	10	n/c

J9 - Serial Port 1 - 10 pin dual row header, AMP 103328-5

PIN	SIGNAL	PIN	SIGNAL
1	Carrier Detect	2	Data Set Ready-I
3	Receive Data-I	4	Request to Send-O
5	Transmit Data-O	6	Clear to Send-I
7	Data Terminal RDY-O	8	Ring Indicator-I
9	Signal Gnd	10	n/c

J10 - Parallel Printer - 25 pin D, AMP 747846-4

PIN	SIGNAL	PIN	SIGNAL (*)
1	Strobe #	2	Data Bit 0
3	Data Bit 1	4	Data Bit 2
5	Data Bit 3	6	Data Bit 4
7	Data Bit 5	8	Data Bit 6
9	Data Bit 7	10	ACK#
11	Busy	12	PError
13	Select	14	Auto Feed#
15	Fault#	16	Init#
17	Slct In#	18	Gnd
19	Gnd	20	Gnd
21	Gnd	22	Gnd
23	Gnd	24	Gnd
25	Gnd		

(*) the "#" after a signal indicates negative true versus positive true.

J11 - CPU Fan - 2 pin single row friction lock, Molex 22-23-2021

PIN	SIGNAL
1	+12V
2	Gnd

J12 - VGA - 15 pin high density D, AMP 748390-5

PIN	SIGNAL	PIN	SIGNAL
1	Red	2	Green
3	Blue	4	PIX Data 2
5	Gnd	6	Gnd
7	Gnd	8	Gnd
9	n/c	10	Gnd
11	PIX Data 0	12	PIX Data 1
13	HSYNC	14	VSYNC
15	PIX Data 3		

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Appendix A: AMIBIOS

American Megatrends, Inc.

User's Guide

Limited Warranty

Limitations of Liability

Trademarks

American Megatrends acknowledges the following trademarks:

Intel and Pentium are registered trademarks of Intel Corporation.

MS-DOS, Microsoft Windows, Windows NT, Xenix, and Microsoft are registered trademarks of Microsoft Corporation.

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Sony is a registered trademark of Sony Corporation.

VESA and VL-Bus are registered trademarks of the Video Electronics Standards Association.

NEC is a registered trademark of Nippon Electric Corporation.

Weitek is a registered trademark of Weitek Corporation.

IBM, AT, VGA, PS/2, Blue Lightning, OS/2, and EGA are registered trademarks of International Business Machines Corporation. XT and CGA are trademarks of International Business Machines Corporation.

Revision History

8/4/95	Initial release for 7/15/95 Core AMIBIOS.
10/31/95	Release of AMIBIOS 95+ (Enhanced 7/15/95 core AMIBIOS).
12/15/95	Additional features added.
5/5/96	Manual updated to reflect 7/15/95 V6.24.
6/5/96	Added USB information to manual. Updated for Version 6.25.
7/2/96	Made minor corrections to manual.

Acknowledgments

This manual was written by Sanjoy Maity and Paul Narushoff.

Technical Support

If you need more information, call American Megatrends technical support at 404-246-8600. Have the following information available before calling:

- BIOS Serial number and revision number,
- BIOS Identification Strings
- a clear description of the problem.

American Megatrends BBS

The BBS permits OEMs, VARs, and system integrators to access technical information about motherboard and BIOS products. Product Engineering Change Notices, Tech Tips, Technical Notes, and complete technical manuals are available on the BBS.

Data Transmission Rates

The BBS automatically handles modems with data transmission rates from 1,200 to 14,400 bps. If using an HST modem, call 404-246-8780. If using a non-HST modem, call 404-246-8782.

BBS Phone Numbers

The following table lists the characteristics of the BBS phone numbers. The BBS requires no parity, 8 data bits, and 1 stop bit.

Phone Number	Characteristics
404-246-8780	Supports HST and v.42.
404-246-8781	Supports HST and v.42.
404-246-8782	Dual standard. Can handle 2400 or 9600 bps. Supports v.32 and v.42. Can handle up to 14,400 baud.
404-246-8783	Supports v.32 and v.42.

Contents

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Chapter 1: Overview

AMIBIOS 95+ includes several major architectural changes in the core BIOS structure.

Interface Module

The AMIBIOS 95+ interface module provides a smooth, easily-modified transition between the BIOS code modules and the runtime BIOS.

New Features

BIOS Version

Press the <Ins> key during AMIBIOS power on to display the core BIOS version number and the BIOS characteristics.

CD-ROM Boot

AMIBIOS can boot from a CD-ROM drive. The CD-ROM will behave like drive A if the CD-ROM has a floppy boot image. It will behave like a hard drive if the CD-ROM has a hard disk boot image.

If the CD-ROM boots as a hard disk drive, it becomes drive C: and all other hard drives are shifted one letter (the hard disk drive becomes drive D:). If it boots as a floppy, the CD-ROM drive becomes drive A: and the first floppy drive becomes drive B:.

Quick Boot

AMIBIOS 95+ can now boot from power on to adaptor ROM initialization in less than five seconds. AMIBIOS 95+ also supports the Instant ON feature as specified in the Intel power management specifications.

Standard Features

AMIBIOS standard features include:

- CPU speed-independent operation,
- automatic detection of system memory,
- automatic sizing of system memory,
- automatic detection of cache memory,
- automatic sizing of cache memory,
- clock switching techniques,
- two levels of password protection,
- ROM shadowing,
- anti-virus protection,
- automatic PCI and PnP configuration,
- PCI support,
- Plug and Play support,
- Flash ROM programming,

Enhanced IDE Support

AMIBIOS supports the Fast ATA, ATAPI, and enhanced IDE standards. BIOS enhanced IDE support includes:

- up to four IDE drives per computer,
- ability to boot from a CD-ROM drive,
- IDE bus master mode,
- 32-bit data transfers,
- large mode drives,
- multi-sector data transfer support,
- LBA mode support for drives with capacities greater than 528 MB,
- advanced Programmed I/O modes 0, 1, 2, and 3
- automatic detection of IDE drive parameters, and
- automatic configuration of IDE drives.

Plug and Play Features

AMIBIOS provides a complete system BIOS solution that incorporates the latest Plug and Play technology. PnP allows end users to upgrade a computer without having to choose system resources, such as IRQs, I/O ports, memory addresses. With PnP, users no longer have to set hardware DIP switches. AMIBIOS includes the following PnP features:

- works with Microsoft Windows 95™,
- complies with Plug and Play v1.0A,
- complies with Version 1.03 of the Extended System Configuration Data (ESCD) specification.
- provides conflict resolution code that guarantees a bootable system every time the computer starts, and

PCI Support

AMIBIOS provides the following PCI (Peripheral Component Interconnect) features:

- complies with the PCI specification version 2.1,
- complies with PCI-PCI Bridge specification version 1.0,
- provides full bus master capability,
- does not need any user intervention, and
- configures all PCI devices with all available resources.

Flash ROM Support

Unlike previous ROM chips, Flash EEPROMs can be reprogrammed via software without removing the BIOS chip. The AMIFlash utility and bootblock flash options allow OEMs and end users to upgrade the system BIOS in a computer quickly and easily without replacing the ROM chip. AMIBIOS 95+ supports all major flash devices. Support is provided for 5V MegaFlash parts. AMIBIOS provides the following flash ROM features:

- the AMIFlash utility allows OEMs and
- end users to update an AMIBIOS,
- AMIFlash disables system shadowing and cache memory,
- AMIBIOS provides hardware-independent operation, and
- AMIBIOS provides flash error recovery.

Flash Device Control

AMIBIOS supports the following flash device controls:

- programming voltage (Vpp),
- flash write enable, and
- A16 inversion for bootblock.

Flash Error Recovery

AMIFlash error recovery features include:

- AMIFlash saves critical system parameters, including shadow RAM, cache memory, and power management parameters, and
- AMIFlash automatically reprograms the original AMIBIOS after a non-fatal error.

Utility	Audience	Description
AMIBIOS Setup	end users	This character-based utility is provided with Hi-Flex AMIBIOS. It configures the computer and manages the NVRAM (Non-Volatile Random Access Memory) in the computer. See the Hi-Flex AMIBIOS User's Guide for additional information.
WINBIOS Setup	end users	This graphically-oriented utility is provided with AMIBIOS. It configures the computer and manages the NVRAM (Non-Volatile Random Access Memory) in the computer. See page 72 for additional information.
System Configuration Utility	end users	The SCU configures both EISA and Plug and Play computers. See the System Configuration Utility User's Guide for additional information.
AMIBCP	American Megatrends OEM BIOS clients	The BIOS Configuration Program allows computer manufacturers to customize AMIBIOS.
AMISSP	American Megatrends OEM BIOS clients	The AMIBIOS Setup script processing utility. An OEM can build AMIBIOS Setup by passing script parameters to this utility.
Embed	American Megatrends OEM BIOS clients	Allows OEMs to embed adaptor ROMs in AMIBIOS. Typical applications include adding SCSI BIOS, network BIOS, or VGA BIOS into AMIBIOS.
DMI Wizard	OEM clients and users	Allows you to modify DMI code and reflash the BIOS ROM.
PCI Router	American Megatrends OEM BIOS clients	Allows OEMs to customize the IRQ routing for PCI-based motherboards. PCI provides four hardware interrupts that can be used in many ways. Of necessity, motherboard IRQ routing must be different in each motherboard design. PCI Route allows motherboard designers to customize the IRQ routing in a standard AMIBIOS for a specific motherboard.
AMIFlash	American Megatrends OEM BIOS clients	AMIFlash allows OEMs and end users to update the BIOS in a computer where the system BIOS is stored on a flash EPROM.
CPUSelect	American Megatrends OEMs	Allows OEMs to customize CPU support in an AMIBIOS.

Configuring an ISA or EISA Computer

Configuration Data

In IBM AT®-compatible and EISA (Extended Industry Standard Architecture) systems, system configuration data must be stored somewhere when the computer is turned off. This data (such as amount of memory, type of disk drives and video display) is stored in NVRAM. The most commonly used NVRAM includes CMOS (complementary metallic oxide semiconductor) RAM and is often called CMOS or CMOS RAM.

Unlike the DRAM (dynamic random access memory) used for standard system memory, NVRAM requires very little power. When the computer is turned off, a back-up battery powers NVRAM, which retains the system parameters. The computer is configured with the values stored in NVRAM by the system BIOS, which gains control when the computer is powered on. The original IBM AT had 64 bytes of NVRAM. All ISA systems have at least 64 bytes of NVRAM, which is usually part of the Real Time Clock chip. EISA systems have at least 4 KB of additional NVRAM to store EISA configuration data.

How Data Is Configured

AMIBIOS provides WINBIOS Setup, stored in NVRAM. This utility is accessed by:

• pressing <Del> at the appropriate time during system boot or

Historically, BIOS Setup utilities have been text-based, processed only keyboard input, and had awkward user interfaces. American Megatrends WINBIOS Setup follows the basic standards for graphical user interfaces. WINBIOS Setup permits mouse access and is so compact that it can reside on the same ROM chip as the system BIOS.

System BIOS

The system BIOS (Basic Input Output System) is the interface between the hardware and the operating system software used in all IBM PC, XT, AT, and PS/2®- compatible computers. The system BIOS, a collection of device drivers, initialization routines, system data, and other code that controls the interface between the operating system and the system hardware on IBM PC, XT, AT, PS/2 or compatible systems, and also on EISA computer systems.

Primary System BIOS Function

The primary system BIOS function is to provide a series of software interrupts and functions that control operations on certain devices, such as the hard disk drive, floppy drive, and video subsystem.

The programmer calls the system BIOS to directly manipulate the system hardware. Before issuing a BIOS call, the programmer writes code that places certain values in certain CPU registers. AMIBIOS interprets these codes and passes values and error codes to the requesting program.

BIOS Function Call Examples

Examples of BIOS interrupts and functions include:

Interrupt	Function	Subfunction	Purpose
INT 13h	AH = 01h	None	Reads the status of the hard disk drives and the error code from the last BIOS hard disk operation.
INT 14h	AH = 03h	None	Reads the serial port status and reports the status in registers AH and AL.
INT 15h	AH = 84h	AL = 01h	Reads the current relative positions of the X and Y coordinates of the two joysticks.

Secondary BIOS Functions

POST

AMIBIOS also performs a series of device initializations and diagnostic tests known as the power on self test (POST). POST can generate error messages and beep codes to indicate a system problem. If an error occurs during POST before AMIBIOS has initialized and configured the display monitor, beeps are sounded to indicate a system problem.

Memory Test

During POST, AMIBIOS completely and thoroughly tests system memory. If there is a problem with memory, AMIBIOS POST displays diagnostic information that helps the end user locate and fix the memory problem.

POST Checkpoint Codes

AMIBIOS POST routines generate checkpoint codes that can be used to diagnose where problems are occurring if the system does not boot. These codes are routed to the Manufacturing Test Port (I/O Port 80h) so that diagnostic equipment can be attached to a problem system to analyze these codes.

Where the System BIOS is Stored

The system BIOS is usually stored in one, two, or four read-only memory (ROM) chips on the motherboard. An ISA system BIOS is located at address F0000h. PCI, PnP BIOS usually start at E0000h and are 128 KB long.

AT-compatible (ISA) BIOSes are normally stored in 64 KB. PCI, PnP, and EISA BIOSes are stored in 128 KB up to 512 KB. The following table shows the number of chips required for each type of ROM chip:

BIOS Size	ROM Type	ROM Size	Number of ROM Chips
64 KB ISA BIOS	27256	256 kilobits	2
64 KB ISA BIOS	27512	512 kilobits	1
64 KB ISA BIOS	27010	1024 kilobits	Not usable
128 KB EISA BIOS	27256	256 kilobits	4
128 KB EISA BIOS	27512	512 kilobits	2
128 KB EISA BIOS	27010	1024 kilobits	1
512 KB EISA BIOS	27010	1024 kilobits	4

Chapter 2: AMIBIOS Features

Supported CPUs

You can add up to 15 additional CPU types via CPUSelect. Multiple CPUs are supported. AMIBIOS automatically detects all Intel x86-compatible CPUs and the CPU speed.

Intel	AMD	Cyrix	IBM	TI®	UMC®	SGS Thompson
386DX	386SXLV	486SL(old)	386SLC	486SLC	U5S	ST486DX
386SX	386DXLV	486DLC(old)	486SLC	486DLC	ST486DX2	
386DX	486DXLV	486SLCe(old)	486SLC2	486SXL		
486SX	486SXLV	486DLCe(old)		486SLCe		
486SX2	386SXL	486Se(M6)		486DLCe		
86SL	386DXL	486DX(M7)		486DX		
486SL	486SXL	486SLC(new)		486DX2		
486DXS	486DXL	486DLC(new)		486DX4		
486SXS	486SXL2	486SLC(upgrade)				
486DX2S	486DXL2	486DLC(upgrade)				
P24D	486SXLV2	486SLC2(upgrade)				
486DX4	486DXLV2	486DLC2(upgrade)				
Pentium	486SXPlus	486S(step A1)				
P54C	486DXPlus	486S(step A2)				
P54CT	486DX2Plus	486S(step B)				
P24T	486DX4Plus	486S2(M6)				
P54CM		486S2e(M6)	486DX			
486SX2S		486DX2 (M7)	486DX2			
P55C		M1				
P5T		486DX4(M7)				
P24C		M1sc, M8, M9, Chili,5x86				
486OverDrive						
Pentium Pro						
P55CT						
Pentium ProT						

Mouse Support

The following mice are supported:

- PS/2 mice,
- bus mice using IRQs 3, 4, or 5 (IRQ2 is not supported for bus mice),
- Microsoft-compatible mice using the M, V, and W series M or M+ protocols, and
- Logitech® C-series-compatible mice using the MM protocol.

Tested Pointing Devices

The following mice are compatible:

Mouse	Description
PS/2	Microsoft PIX, Logitech MouseMan PIX M-CJ13, Keytronic® KeyMouse, True Mouse - 00343, Dell® Mouse - 0019306, Sejin® SWB-200, Micro Track® Trackball PD600-9333, Addison® Trackball #20038, Expert Mouse® (Trackball) Version 2.0
bus	Mice that use IRQs 3, 4, or 5 are supported. Mice that use IRQ 2 are not supported. Microsoft mouse with Microsoft Bus Mouse Rev-C card, Microsoft InPort mouse with Logitech Bus card, Logitech Bus mouse M-PD13-9MD with Logitech Bus card
Microsoft-compatible	The M, V, W Series using the M or M+ protocol are supported.
Logitech C- compatible	Mice that use the MM protocol are supported.
serial	Microsoft PIX, Microsoft 37967, Logitech MouseMan PIX M-CJ13, Logitech C-Series CC-93-9F, Logitech FirstMouse® M-MD15L-9F, Logitech KIDZ M-ME23-9F, Logitech MouseMan Cordless M-RA12, Logitech Trackman T-CC3-9F, Genius® (MS and MSC compatible) GM-D321, Addison 290 #20010 (MS and MSC compatible), Addison 420 #20015 (MS and MSC compatible), Addison 400 ErgoMouse H7001 (MS and MSC compatible), Addison Trackball #20038, Mouse Systems® MSC 401961-002/E (MS and MSC compatible), Flash Point-2, Dexxa® MF21-9F, Easy Options® #60G3580, PC Accessories® 280PCA #20010 (MS and MSC compatible), PC Accessories Keyboard with Tracking Ball KB-5591, Digitus® (The Magic Click) ASM-604880, Micro Track Trackball PD600-9333, Expert Mouse (Trackball) Version 2.0, Compudyne® MUS2G (MS and MSC compatible), Mouse Systems 403470-002, Mouse Systems Optical Mouse 401961-002/E, Firenze® Mouse TC6, AT4 Mouse AT-5 (MS and MSC compatible), Optronix® Corporation X-30M.

Types of Mouse Pointing Devices

There are four general types of mouses:

- serial mouse,
- PS/2 mouse/port mouse,
- serial and PS/2 mouse/port mouse combination, and
- the bus or inport mouse.

Serial Mouse

A serial mouse should only be connected to an RS232C serial port. It cannot be connected to a PS/2 mouse port. No matter which adapter is used, a serial mouse expects ±12V RS232C logic levels, not the +5V TTL logic levels used by a PS/2 mouse port.

PS/2 mouse

A PS/2 mouse can only be connected to a PS/2 mouse port. A PS/2 mouse cannot be connected to an RS23C serial port.

The PS/2 mouse will be damaged if subjected to the RS23C ±12V logic levels if you attach an adapter to connect a PS/2 mouse to a serial port.

Serial/PS/2 Mouse Combination

Microsoft and Logitech manufacture combination serial and PS/2 mouses:

- Microsoft combination mouses are labeled *Serial/PS2* or *Serial Mouse Port.*
- Logitech combination mouses are labeled *Serial Mouse Port.*

The Microsoft and Logitech combination mouses have different input circuits and must be handled differently, as follows:

If...	then...
the combination mouse has a DB9 serial connector directly molded onto its cable...	this mouse can be used directly in either an RS232C serial port or an American Megatrends PS/2 mouse port using the 10-pin berg to DB9 cable provided by American Megatrends in the motherboard package. This kind of mouse can also be used on a six-pin miniDIN PS/2 mouse port using the DB9-to-miniDIN adapter usually supplied with the mouse.
The combination mouse has a six-pin miniDIN connector directly molded on its cable...	this mouse can be used directly in an RS232C serial port using the DB9-to-miniDIN adapter usually supplied with the mouse. This kind of mouse can also be connected to an American Megatrends motherboard PS/2 mouse port using the 10-pin berg to DB9 cable provided by American Megatrends in the motherboard package and a special adapter provided by Washburn and Company (716-385-5200). This kind of mouse can also be directly connected to a six-pin miniDIN PS/2 mouse port.

Bus Mouse

A bus mouse always has a nine-pin miniDIN plug molded on the mouse cable. This type of mouse can only be used with the Bus Mouse Card provided with the mouse or with other adapter cards that provided a Bus Mouse Port. Some ATI display adapter cards provide such a port.

Standard Features

Fast ATA

AMIBIOS supports the Fast ATA specification.

Fast ATA uses Programmed I/O, IDE mode 3, and multiword DMA mode 1 to achieve higher data transfer rates.

Enhanced IDE Support

AMIBIOS supports hard disk drives with capacities of more than 528 MB, block mode (multisector data transfer) 32-bit data transfer, advanced PIO, LBA (Logical Block Address) Mode, up to four IDE hard disk drives, and the IDE standby timer.

Maximum System Memory

AMIBIOS now supports up to 2 GB of system memory.

Megakey Support

The American Megatrends Megakey® keyboard controller is supported. Megakey provides power management features.

PCI Support

The PCI Version 2.0 specification is supported. PCI support can be provided in computers that have extended CMOS RAM or that work with minimal CMOS RAM.

ECP and EPP Support

AMIBIOS supports ECP (Extended Communications Port) and EPP (Enhanced Parallel Port in the INT 17h Parallel Port Service. This support is present if the computer has the appropriate hardware and I/O support is provided in AMIBIOS.

Password Protection

AMIBIOS offers two system passwords. AMIBIOS password inhibits all mouse, pen, and keyboard access but permits background tasks to continue. The password is configured in WINBIOS Setup. The password prompt can occur every time WINBIOS Setup is executed or every time the system boots.

Keyboard Error Detection

AMIBIOS displays a keyboard error if a mouse is inadvertently attached to the keyboard connector.

Automatically Detects Memory

AMIBIOS checks all system and cache memory and reports them both on the initial AMIBIOS screen and the AMIBIOS System Configuration Screen that appears after POST is completed. Both cache memory and system memory are automatically configured by AMIBIOS.

In systems with more than 1 MB, AMIBIOS reports 384 KB less RAM than it finds, because it accounts for the address space between 640K and 1024K that isunavailable to DOS. This space is used for video RAM, video BIOS, system BIOS, and adaptor ROMs.

Configures Non-Standard Systems

Through AMIBIOS Setup, you can easily configure systems that have no keyboards, monitors, or disk drives by selecting *Not Installed* in Standard Setup.

All error messages about missing devices are suppressed, resulting in a normal boot.

2.88 MB 3½" Floppy Drives

AMIBIOS supports 2.88 MB 3½" floppy drives.

User-Definable Hard Disks

AMIBIOS allows the end user to define hard disk types for both hard drives in a system.

Chapter 3: Enhanced IDE Support

AMIBIOS 95+ supports the following enhanced IDE features:

- Block mode (Multi-sector) transfer,
- 32-bit transfer,
- Advanced PIO modes (modes 0 – 3),
- LBA mode for drives with capacities greater than 528 MB,
- up to four hard disk drives, and
- Standby timer.

User-Selected

All enhanced IDE features can be configured by the end user through AMIBIOS Setup or WINBIOS Setup. The difference between user selection and the action taken by AMIBIOS depends mainly on hardware support of the feature.

You should include AMIBIOS Setup or WINBIOS Setup options for IDE Block mode (multisector) transfer, 32-bit transfer, LBA mode, Prefetch, and IDE PIO separately for each IDE hard disk drive

Block Mode (Multi-Sector) Transfer

Block mode boosts IDE drive performance by increasing the amount of data transferred. Only 512 bytes of data can be transferred per interrupt if block mode is not used. Block mode allows transfers of up to 64 KB per interrupt.

If the IDE drive supports block mode and it is enabled in WINBIOS Setup, AMIBIOS enables multi-sector transfers. AMIBIOS sets the number of sectors to be transferred per interrupt to the value returned by the identify drive command.

LBA Mode for Drives over 528 MB

LBA (Logical Block Addressing) is a new method of addressing data on a disk drive. In the ST506 (MFM) ISA hard disk drive standard, data is accessed via a Cylinder-Head-Sector format. Because the number of cylinders, disk drive heads, and sector is limited, an MFM drive can hold a maximum of 528 MB of data.

In LBA mode, the maximum drive capacity is 8.4 GB.

LBA Mode Disabled

If LBA Mode is disabled in AMIBIOS Setup or WINBIOS Setup, AMIBIOS uses the physical parameters of the hard disk and AMIBIOS does not translate parameters. The operating system that uses the parameter table will only see 528 MB hard disk space even if the hard disk is greater than 528 MB.

LBA Mode Enabled

If enabled in WINBIOS Setup and supported by the hard disk, AMIBIOS enables LBA mode and translates the physical parameters of the hard disk drive. If the hard disk is formatted, AMIBIOS enables LBA mode. If a hard disk that supports LBA mode and has a capacity greater than 528 MB was formatted with LBA mode disabled, AMIBIOS does not enable LBA mode even if LBA mode is enabled in AMIBIOS or WINBIOS Setup.

32-Bit Transfer

Hard disk drives connected to the computer via the ISA bus transfer data 16 bits at a time. An IDE drive on the PCI bus or VL-Bus can use a 32-bit data path. If enabled in AMIBIOS Setup or WINBIOS Setup, AMIBIOS enables 32-bit data transfers. If the host does not support 32-bit transfer, this feature should be disabled.

Advanced PIO Mode

IDE PIO mode programs timing cycles between the IDE drive and the programmable IDE controller. As the PIO mode increases, the cycle time decreases. IDE PIO modes 3 through 7 are the advanced PIO modes. The IDE controller on the motherboard (or an adapter card) must support the IORDY signal before an advanced IDE PIO mode can be implemented. The host IDE controller either does or does not support the IORDY signal. The IDE drive data transfer algorithm is different if it does not support IORDY. The word offsets referred to in the following algorithms corresponds to word offset in 512 bytes buffer returned by identify drive command.

 If Host Does Not Support IORDY

If the host does not support the IORDY signal (it cannot use advanced PIO modes 3-7):

Step	Action
1	if bit 1 of word 53 is 1, get the PIO transfer cycle time in nanoseconds from word 67 and program the host to set the cycle time.
2	if bit 1 of word 53 is 0, get the mode value from bits 15-8 of word 51, calculate the cycle time from the mode value, and program the host to set the cycle time.

If Host Supports IORDY

If the host supports the IORDY signal (it can use advanced PIO modes 3-7):

If...	then...
bit 1 of word 53 is 1 and bit 11 of word 49 is 0,	the drive does not support IORDY. Get the PIO transfer cycle time in nanoseconds from word 67 and program the host to set the cycle time.
bit 1 of word 53 is 1 and bit 11 of word 49 is 1,	the drive supports IORDY. Get the PIO transfer cycle time in nanoseconds from word 68. Calculate the mode value from the cycle time. If the calculated mode value is equal to or greater than three and the corresponding bit of word 64 is 0, force the calculated mode value to 0 and force cycle time to 600ns. Issue the Set Features command to drive to enable the PIO calculated mode in flow control transfer mode. Program the host to set the cycle time.
bit 1 of word 53 is 0,	get the mode value from bits 15-8 of word 51, calculate the cycle time from the mode value, and program the host to set the cycle time.

Hardware Dependent

The programming algorithm to set the host for proper cycle time is dependent on hardware and has to be developed according to the hardware specifications.

Cycle Timing

The relation between the IDE PIO mode value and IDE cycle timing is shown below. The cycle timings are stored in words 67 and 68.

Mode	0	1	2	3	4
Timing	600 ns	383 ns	240 ns	180 ns	120 ns

Mode Values

The IDE PIO mode value is stored in bits 15-8 of word 51. If the mode value is 3 or 4, force the mode value to 0.

Support for Four IDE Hard Disk Drives

AMIBIOS 95+ supports computers with up to four hard disks through a primary and secondary controller. The primary controller uses I/O port addresses 1F0h – 1F7h, 3F6h, and IRQ 14. The secondary controller uses I/O port addresses 170h – 177h, 376h, and IRQ 15.

The hard disk drives connected to primary controller are user-selectable through AMIBIOS Setup or WINBIOS Setup and can be auto-detected by WINBIOS Setup.

The hard disk drives connected to the secondary controller are always auto-detected and are not user selectable. WINBIOS Setup includes two options that allow the end user to specify secondary master and slave drives. The secondary slave drive cannot be installed without first installing the secondary master drive.

In the next release of AMIBIOS, the disks connected to secondary controller will be user selectable through setup and setup will have icons to auto-detect the hard disks connected to secondary controller.

LBA Mode Operating System Environment

LBA Mode must be set as follows depending on the operating system.

Operating System	Necessary Action
SCO® Unix 3.2.4	LBA mode must be disabled in WINBIOS Setup.
Novell NetWare®	LBA mode must be disabled in WINBIOS Setup.
DOS	LBA mode must be enabled in WINBIOS Setup if the IDE hard disk capacity is greater than 528 MB.
Windows 95	LBA mode must be enabled in WINBIOS Setup if the IDE hard disk capacity is greater than 528 MB.
Windows	LBA mode must be enabled in WINBIOS Setup if the IDE hard disk capacity is greater than 528 MB.
Windows NT	LBA mode must be enabled in WINBIOS Setup if the IDE hard disk capacity is greater than 528 MB.
OS/2® 2.1	LBA mode must be enabled in WINBIOS Setup if the IDE hard disk capacity is greater than 528 MB.

Chapter 4: Power-On Self Test

AMIBIOS provides all IBM standard Power-On Self Test (POST) routines as well as enhanced AMIBIOS POST routines. AMIBIOS POST supports CPU internal diagnostics. AMIBIOS POST checkpoint codes are accessible via the Manufacturing Test Port (I/O Port 80h). AMIBIOS checkpoint codes are documented in the *AMIBIOS Technical Reference.*

POST Phases

Every time the system is powered on, AMIBIOS executes two types of POST routines:

System Test and Initialization (test and initialize AMIBIOS for normal operations) and

System Configuration Verification (compare defined configuration with hardware actually installed).

BIOS Error Reporting

BIOS errors are reported in one of two ways:

Beep Codes

Fatal errors, which halt the boot process, are communicated through a series of audible beeps. If AMIBIOS POST can initialize the system video display, it displays the error message. Displayed error messages, in most cases, allow the system to continue to boot. Displayed error messages are described later in this chapter.

Beeps	Error message	Description
1	Refresh Failure	The memory refresh circuitry is faulty.
2	Parity Error	Parity error in the base memory (the first 64 KB block) of memory.
3	Base 64 KB Memory Failure	Memory failure in first 64 KB.
4	Timer Not Operational	A memory failure in the first 64 KB of memory, or Timer 1 is not functioning.
5	Processor Error	The CPU generated an error.
6	8042 - Gate A20 Failure	Cannot switch to protected mode.
7	Processor Exception Interrupt Error	The CPU on the CPU Card generated an exception interrupt.
8	Display Memory Read/Write Error	The system video adapter is either missing or its memory is faulty. This is not a fatal error.
9	ROM Checksum Error	The ROM checksum value does not match the value encoded in AMIBIOS.
10	CMOS Shutdown Register Read/Write Error	The shutdown register for CMOS RAM has failed.
11	Cache Memory Bad — Do Not Enable Cache	The cache memory test failed. Cache memory is disabled. Do not press <Ctrl> <Alt> <Shift> <+> to enable cache memory.

Troubleshooting System Problems

If the Computer Beeps

If it beeps...	then...
1, 2, or 3 times...	reseat the memory SIMMs or DIPs. If the system still beeps, replace the memory.
6 times...	reseat the keyboard controller chip. If it still beeps, replace the keyboard controller. If it still beeps, try a different keyboard, or replace the keyboard fuse, if the keyboard has one.
8 times...	there is a memory error on the video adapter. Replace the video adapter, or the RAM on the video adapter.
9 times...	the BIOS ROM chip is bad. The system probably needs a new BIOS ROM chip.
11 times...	reseat the cache memory on the motherboard. If it still beeps, replace the cache memory.
4, 5, 7, or 10 times...	the motherboard must be replaced.

AMIBIOS Displayed Error Messages

If an error occurs after the system display has been initialized, the error message are displayed as follows:

```
ERROR Message Line 1
ERROR Message Line 2
Press <F1> to continue
```

and the system halts. The system does not halt if *Wait for <F1> If Any Error* in Advanced Setup is *Disabled.*

```
RUN SETUP UTILITY.
```

can also appear. Press <F1> to run WINBIOS Setup if this message appears.

Error Message	Explanation
8042 Gate-A20 Error	Gate A20 on the keyboard controller (8042) is not working. Replace the 8042.
Address Line Short!	Error in the address decoding circuitry.
C: Drive Error	No response from drive C:. Run the AMIDiag Hard Disk Utility. Check the C: hard disk type in Standard Setup.
C: Drive Failure	No response from hard disk drive C:. Replace the drive.
Cache Memory Bad, Do Not Enable Cache!	Cache memory is defective. Run AMIDiag.
CH-2 Timer Error	An AT system has two timers. There is an error in timer 2.
CMOS Battery State Low	CMOS RAM is powered by a battery. The battery power is low. Replace the battery.
CMOS Checksum Failure	CMOS RAM checksum is different than the previous value. Run WINBIOS Setup.
CMOS System Options Not Set	The values stored in CMOS RAM have been destroyed. Run WINBIOS Setup.
CMOS Display Type Mismatch	The video type in CMOS RAM does not match the type detected. Run WINBIOS Setup.
CMOS Memory Size Mismatch	The amount of memory found by AMIBIOS is different than the amount in CMOS RAM. Run WINBIOS Setup.
CMOS Time and Date Not Set	Run Standard Setup to set the date and time.
D: Drive Error	No response from drive D:. Run the AMIDiag Hard Disk Utility. Check the hard disk type in Standard Setup.
D: drive failure	No response from hard disk drive D:. Replace the drive.
Diskette Boot Failure	The boot diskette in drive A: cannot be used to boot the system. Use another boot diskette and follow the screen instructions.

Error Message	Explanation
Display Switch Not Proper	Some systems require a video switch be set to either color or monochrome. Turn the system off, set the switch properly, then power on.
DMA Error	Error in the DMA controller.
DMA 1 Error	Error in the first DMA channel.
DMA 2 Error	Error in the second DMA channel.
FDD Controller Failure	AMIBIOS cannot communicate with the floppy disk drive controller. Check all appropriate connections after the system is powered down.
HDD Controller Failure	AMIBIOS cannot communicate with the hard disk drive controller. Check all appropriate connections after the system is powered down.
INTR1 Error	Interrupt channel 1 failed POST.
INTR2 Error	Interrupt channel 2 failed POST.
Invalid Boot Diskette	AMIBIOS can read the diskette in floppy drive A:, but it cannot boot the system with it. Use another boot diskette and follow the screen instructions.
Keyboard Is Locked...Unlock It	The keyboard lock on the system is engaged. The system must be unlocked to continue to boot.
Keyboard Error	The keyboard has a timing problem. Make sure a Keyboard Controller AMIBIOS is installed. Set Keyboard in Advanced Setup to Not Installed to skip the keyboard POST routines.
KB/Interface Error	There is an error in the keyboard connector.
No ROM BASIC	Cannot find a proper bootable sector on drive A:, C:, or CD-ROM drive. AMIBIOS cannot find ROM Basic.
Off Board Parity Error	Parity error in memory installed on an adapter card in an expansion slot. The format is: OFF BOARD PARITY ERROR ADDR = (XXXX) XXXX is the hex address where the error occurred. Run AMIDiag to find and correct memory problems.
On Board Parity Error	Parity error in motherboard memory. The format is: ON BOARD PARITY ERROR ADDR = (XXXX) XXXX is the hex address where the error occurred. Run AMIDiag to find and correct memory problems.
Parity Error ????	Parity error in system memory at an unknown address. Run AMIDiag to find and correct memory problems.

POST Memory Test

Normally, the only visible POST routine is the memory test. The screen that appears when the system is powered on is shown below.

```
AMIBIOS (C) 1995 American Megatrends Inc.
XXXXX KB OK
Hit <DEL> if you want to run SETUP
(C) American Megatrends Inc.
XX-XXXX-XXXXXX-XXXXXXXX-XXXXXX-XXXX-X
```

An AMIBIOS Identification string is displayed at the left bottom corner of the screen, below the copyright message. Press <Ins> during system boot to display two additional AMIBIOS Identification strings.

AMIBIOS Identification Strings show the options installed in AMIBIOS. You will need this information when calling for technical support.

Displaying Additional AMIBIOS ID Strings

Step	Action
1	Enable Wait for <F1> If any Error in Advanced Setup to Enabled before freezing the screen.
2	When a problem occurs, freeze the screen by powering on the system and holding a key down on the keyboard to cause a Keyboard Error message.
3	Copy the three lines and report this information to American Megatrends. Press <F1> to continue the boot process.

The following appears after POST completes:

```
Hit <DEL> if you want to run SETUP
```

Press <Del> to access WINBIOS Setup.

ISA NMI Handler Messages

ISA NMI Message	Explanation
Memory Parity Error at xxxxx	Memory failed. If the memory location can be determined, it is displayed as xxxxx. If not, the message is Memory Parity Error ????.
I/O Card Parity Error at xxxxx	An expansion card failed. If the address can be determined, it is displayed as xxxxx. If not, the message is I/O Card Parity Error ????.
DMA Bus Time-out	A device has driven the bus signal for more than 7.8 microseconds.

AMIBIOS Configuration Screen

AMIBIOS displays a screen that looks similar to the following when the POST routines complete successfully.

AMIBIOS System Configuration (C) Copyright 1985-95 American Megatrends Inc.			
Main Processor	: Pentium	Base Memory Size	: 640 KB
Numeric Coprocessor	: Present	Ext. Memory Size	: 7808 KB
Floppy Drive A:	: 1.2 MB	Display Type	: EGA/VGA
Floppy Drive B:	: 1.44 MB	Serial Port(s)	: 3F8
ROM-BIOS Date:	: 07/15/95	Parallel Port(s)	: 378

Chapter 5: WINBIOS Setup

WINBIOS Setup configures system information that is stored in CMOS RAM. WINBIOS Setup has an easy-to-use graphical user interface that will be immediately recognizable to anyone who has ever used Microsoft Windows. WINBIOS Setup sets a new standard in BIOS user interfaces.

Starting WINBIOS Setup

As POST executes, the following appears:

```
Hit <DEL> if you want to run SETUP
```

Press <Del> to run WINBIOS Setup.

WINBIOS Setup Features

Icon-Based User Interface

WINBIOS Setup functions are all available in an easily-accessible graphical user interface.

Automatic Option Selection

AMIBIOS can be configured to reflect dependencies between AMIBIOS features and WINBIOS Setup options.

For example, the **External Cache** option in Advanced Setup can be programmed to be displayed if the computer has secondary cache memory but to be absent if there is no secondary cache memory.

Help Screens

WINBIOS Setup provides Help screens for Advanced Setup, Chipset Setup, and Peripheral Setup.

Help on mouse and keyboard is also available. Choose Help by pressing <Alt> <H>.

Access WINBIOS Setup via Hot Key

A keystroke combination can be used to run WINBIOS Setup from DOS or Microsoft Windows.

Automatic WINBIOS Setup Option Selection

If selecting a certain setting for one WINBIOS Setup option determines the settings for one or more other WINBIOS Setup options, AMIBIOS automatically assigns the dependent settings and does not permit the end user to modify these settings unless the setting for the parent option is changed.

For example, the Serial Port options in Peripheral Setup can be set to *2F8h, 3F8h, 2E8h,* or *3E8h.* If *2F8h* is chosen by the end user for Serial Port 1, AMIBIOS disables *2F8h* for Serial Port 2. Invalid options are grayed and cannot be selected.

Num Lock

WINBIOS Setup allows the end user to set the Num Lock key on or off at system boot.

Point and Click Interface

WINBIOS Setup uses the familiar point and click navigation technique. The end user can point with the mouse anywhere on the screen, click the left mouse button, and WINBIOS Setup control is transferred to the new location.

The previous window is closed. All parameters that have been changed will automatically be saved, pending the selection on the exit screen.

Mouse Support

The following devices are supported:

• PS/2-type mice,

• bus mice that use IRQs 3, 4, or 5 (IRQ2 is not supported),

• Microsoft-compatible mice that use the M, V, W Series M and M+ protocols, and

• Logitech C-series-compatible mice using the MM protocol.

Typematic Rate and Delay

AMIBIOS allows the end user to set the speed that a keystroke is repeated at and the delay before the repeating starts in WINBIOS Setup.

Memory Test Tick Sound

AMIBIOS permits the end user to press <Esc> or <Del> during the memory test to disable the ticking sound and bypass the memory test.

Using a Mouse with WINBIOS Setup

WINBIOS Setup can be accessed via keyboard, mouse, or pen. The mouse click functions are:

- single click to change or select both global and current fields and
- double-click to perform an operation in the selected field.

Using the Keyboard with WINBIOS Setup

WINBIOS Setup has a built-in keyboard driver that uses simple keystroke combinations:

Keystroke	Function
<Tab>	Move to the next window or field.
→,←,↑,↓	Move to the next field to the right, left, above, or below.
<Enter>	Select in the current field.
+	Increments a value.
-	Decrements a value.
<Esc>	Closes the current operation and return to previous level.
<PgUp>	Returns to the previous page.
<PgDn>	Advances to the next page.
<Home>	Returns to the beginning of the text.
<End>	Advances to the end of the text.
<Alt> <H>	Access a help window.
<Alt> <Spacebar>	Exit WINBIOS Setup.
Alphabetic keys	A to Z are used in the Virtual Keyboard, and are not case-sensitive.
Numeric keys	0 to 9 are used in the Virtual Keyboard and Numeric Keypad.

WINBIOS Setup Main Menu

The WINBIOS Setup main menu is organized into four windows. Each window corresponds to a section in this chapter. Each section contains several icons. Clicking on each icon activates a specific function. The WINBIOS Setup icons and functions are described in this chapter.

Default Settings

Each WINBIOS Setup option has two default settings. These settings can be applied to all WINBIOS Setup options when you select the Default section on the WINBIOS Setup main menu. The types of defaults are:

Defaults	Description
Optimal	These settings provide the best performance characteristics.
Fail-Safe	These settings are more likely to configure a workable computer when something is wrong. If you cannot boot the computer successfully, select the Fail-Safe WINBIOS Setup options and try to diagnose the problem after the computer boots. These settings do not provide optimal performance.

Section 1: Setup Types

Standard Setup

Standard Setup options are displayed by choosing the Standard icon from the WINBIOS Setup menu. All Standard Setup options are described below.

Date/Time

Select the Date/Time option to change the date or time. The current date and time are displayed. Enter new values through the displayed window.

Floppy Drive A, B

Choose the Floppy Drive A or B icon to specify the floppy drive type. The settings are *360 KB 5¼"*, *1.2 MB 5¼"*, *720 KB 3½"*, *1.44 MB 3½"*, or *2.88 MB 3½"*.

Pri Master

Pri Slave

Sec Master

Sec Slave

Choose these icons to configure the hard disk drive named in the option. When you click on an icon, the following parameters are listed: Type, LBA/Large Mode, Block Mode, 32Bit Mode, and PIO Mode. All parameters relate to IDE drives except **Type.**

Configuring an MFM Drive

If configuring an old MFM hard disk drive, you must know the drive parameters (number of heads, number of cylinders, number of sectors, the starting write precompensation cylinder, and drive capacity). Choose **Type** and choose the appropriate hard disk drive type (1 - 46). The old MFM hard drive types are listed on page 82. If the drive parameters of your MFM drive do not match any drive type listed on page 82, select *User* in the **Type** field and enter the drive parameters on the screen that appears.

User-Defined Drive

If you are configuring a SCSI drive or an MFM, RLL, ARLL, or ESDI drive with drive parameters that do not match drive types 1-46, you can select the *User* in the **Type** field. You must then enter the drive parameters on the screen that appears. The drive parameters include:

- Cylinder (number of cylinders),
- Hd (number of heads),
- WP (starting write precompensation cylinder),
- Sec (number of sectors),
- Size (drive capacity).

Parameter	Description
Type	The number for a drive with certain identification parameters.
Cylinders	The number of cylinders in the disk drive.
Heads	The number of heads.
Write Precompensation	The size of a sector gets progressively smaller as the track diameter diminishes. Yet each sector must still hold 512 bytes. Write precompensation circuitry on the hard disk compensates for the physical difference in sector size by boosting the write current for sectors on inner tracks. This parameter is the track number where write precompensation begins.
Landing Zone	This number is the cylinder location where the heads will normally park when the system is shut down.
Sectors	The number of sectors per track. MFM drives have 17 sectors per track. RLL drives have 26 sectors per track. ESDI drives have 34 sectors per track. SCSI and IDE drives have more sectors per track.
Capacity	The formatted capacity of the drive is (Number of heads) x (Number of cylinders) x (Number of sectors per track) x (512 bytes per sector)

Configuring IDE Drives

If the hard disk drive to be configured is an IDE drive, select the appropriate drive icon (Pri Master, Pri Slave, Sec Master, or Sec Slave). Select the IDE Detect icon to automatically detect all drive parameters.

AMIBIOS automatically detects the IDE drive parameters (including ATAPI CD-ROM drives) and displays them. Click on the OK button to accept these parameters Or you can set the parameters manually if you are absolutely certain that you know the correct IDE drive parameters.

Click on **LBA/Large Mode** and choose *On* to enable support for IDE drives with capacities greater than 528 MB.

Click on **Block Mode** and choose *On* to support IDE drives that use Block Mode.

Click on **32Bit Mode** and click on *On* to support IDE drives that permit 32-bit accesses.

Click on **PIO Mode** to select the IDE Programmed I/O mode. PIO programming also works with ATAPI CD-ROM drives. The settings are *Auto, 0, 1, 2, 3, 4,* or *5.* Click on *Auto* to allow AMIBIOS to automatically find the PIO mode that the IDE drive being configured uses. If you select *0-5* you must make absolutely certain that you are selecting the PIO mode supported by the IDE drive being configured.

Configuring a CD-ROM Drive

Select the appropriate drive icon (Pri Master, Pri Slave, Sec Master, or Sec Slave). Choose the **Type** parameter and select CDROM. You can boot the computer from a CD-ROM drive. You can also choose *Auto* and let AMIBIOS will automatically set the correct drive parameters.

Hard Disk Drive Types

Type	Cylinders	Heads	Write Precompensation	Landing Zone	Sectors	Capacity
1	306	4	128	305	17	10 MB
2	615	4	300	615	17	20 MB
3	615	6	300	615	17	31 MB
4	940	8	512	940	17	62 MB
5	940	6	512	940	17	47 MB
6	615	4	65535	615	17	20 MB
7	462	8	256	511	17	31 MB
8	733	5	65535	733	17	30 MB
9	900	15	65535	901	17	112 MB
10	820	3	65535	820	17	20 MB
11	855	5	65535	855	17	35 MB
12	855	7	65535	855	17	50 MB
13	306	8	128	319	17	20 MB
14	733	7	65535	733	17	43 MB
16	612	4	0	663	17	20 MB
17	977	5	300	977	17	41 MB
18	977	7	65535	977	17	57 MB
19	1024	7	512	1023	17	60 MB
20	733	5	300	732	17	30 MB
21	733	7	300	732	17	43 MB
22	733	5	300	733	17	30 MB
23	306	4	0	336	17	10 MB
24	925	7	0	925	17	54 MB
25	925	9	65535	925	17	69 MB
26	754	7	754	754	17	44 MB
27	754	11	65535	754	17	69 MB
28	699	7	256	699	17	41 MB
29	823	10	65535	823	17	68 MB
30	918	7	918	918	17	53 MB
31	1024	11	65535	1024	17	94 MB
32	1024	15	65535	1024	17	128 MB
33	1024	5	1024	1024	17	43 MB
34	612	2	128	612	17	10 MB
35	1024	9	65535	1024	17	77 MB
36	1024	8	512	1024	17	68 MB
37	615	8	128	615	17	41 MB
38	987	3	987	987	17	25 MB
39	987	7	987	987	17	57 MB
40	820	6	820	820	17	41 MB
41	977	5	977	977	17	41 MB
42	981	5	981	981	17	41 MB
43	830	7	512	830	17	48 MB
44	830	10	65535	830	17	69 MB
45	917	15	65535	918	17	114 MB
46	1224	15	65535	1223	17	152 MB
USER-DEFINED HARD DRIVE - Enter user-supplied parameters.						

Advanced Setup

Advanced Setup options are displayed by choosing the Advanced icon from the WINBIOS Setup main menu. All Advanced Setup options are described in this section.

Quick Boot

Set this option to *Enabled* to instruct AMIBIOS to boot quickly when the computer is powered on. This option replaces the old **Above 1 MB Memory Test** Advanced Setup option. The settings are:

Setting	Description
Disabled	AMIBIOS test all system memory. AMIBIOS waits up to 40 seconds for a READY signal from the IDE hard disk drive. AMIBIOS waits for .5 seconds after sending a RESET signal to the IDE drive to allow the IDE drive time to get ready again. AMIBIOS checks for a <Del> key press and runs WINBIOS Setup if the key has been pressed.
Enabled	AMIBIOS does not test system memory above 1 MB. AMIBIOS does not wait up to 40 seconds for a READY signal from the IDE hard disk drive. If a READY signal is not received immediately from the IDE drive, AMIBIOS does not configure that drive. AMIBIOS does not wait for .5 seconds after sending a RESET signal to the IDE drive to allow the IDE drive time to get ready again. You cannot run WINBIOS Setup at system boot, because there is no delay for the Hit <Del> to run Setup message.

The Optimal and Fail-Safe default settings are *Enabled.*

Boot Up Sequence

This option sets the sequence of boot drives (floppy drive A:, hard disk drive C:, or a CD-ROM drive) that the AMIBIOS attempts to boot from after AMIBIOS POST completes. The settings are *C:,A:,CDROM, CDROM,A:,C:,* or *A:,C:, CDROM.*

The default settings are *C:,A:,CDROM.*

Boot Up Num Lock

Set this option to *Off* to turn the Num Lock key off when the computer is booted so you can use the arrow keys on both the numeric keypad and the keyboard. The settings are *On* or *Off.* The default settings are *On.*

Floppy Drive Swap

Set this option to *Enabled* to permit drives A: and B: to be swapped. The settings are *Enabled* or *Disabled.* The default settings are *Disabled.*

Floppy Drive Seek

Set this option to *Enabled* to specify that floppy drive A: will perform a Seek operation at system boot. The settings are *Disabled* or *Enabled.* The Optimal and Fail-Safe default settings are *Disabled*.

Typematic Rate

This option specifies the speed at which a keyboard keystroke is repeated. The settings are *Fast* or *Slow.* The Optimal and Fail-Safe default settings are *Fast.*

System Keyboard

This option specifies that a keyboard is attached to the computer. The settings are *Present* or *Absent.* The Optimal and Fail-Safe default settings are *Present.*

Primary Display

This option specifies the type of display monitor and adapter in the computer. The settings are *Mono, CGA40, CGA80, EGA/VGA,* or *Absent*. The Optimal and Fail-Safe default settings are EGA/VGA.

Password Check

This option enables password checking every time the computer is powered on or every time WINBIOS Setup is executed. If *Always* is chosen, a user password prompt appears every time the computer is turned on. If *Setup* is chosen, the password prompt appears if WINBIOS is executed.

The Optimal and Power-On defaults are *Setup.*

Parity Check

Set this option to *Enabled* to check the parity of all system memory. The settings are *Disabled* or *Enabled*. The Optimal and Fail-Safe default settings are *Disabled*.

OS/2 Compatible Mode

Set this option to *Enabled* to permit AMIBIOS to run with IBM OS/2. The settings are *Enabled* or *Disabled.* The default settings are *Disabled.*

Wait For F1 if Error

AMIBIOS POST error messages are followed by:

```
Press <F1> to continue
```

If this option is set to *Disabled,* AMIBIOS does not wait for you to press the <F1> key after an error message. The settings are *Disabled* or *Enabled*. The Optimal and Fail-Safe default settings are *En-abled.*

Hit Del Message Display

Set this option to *Disabled* to prevent

```
Hit <DEL> if you want to run Setup
```

from appearing on the first AMIBIOS screen when the computer boots. The settings are *Disabled* or *Enabled*. The Optimal and Fail-Safe default settings are *Enabled*.

Internal Cache

This option specifies the caching algorithm used for L1 internal cache memory. The settings are:

Setting	Description
Disabled	Neither L1 internal cache memory on the CPU or L2 secondary cache memory is enabled.
WriteBack(default)	Use the write-back caching algorithm.
WriteThru	Use the write-through caching algorithm.

External Cache

This option specifies the caching algorithm used for L2 secondary (external) cache memory. The settings are:

Setting	Description
Disabled	Neither L1 internal cache memory on the CPU or L2 secondary cache memory is enabled.
WriteBack(default)	Use the write-back caching algorithm.
WriteThru	Use the write-through caching algorithm.

System BIOS Shadow Cacheable

When this option is set to *Enabled,* the contents of the F0000h system memory segment can be read from or written to L2 secondary cache memory. The contents of the F0000h memory segment are always copied from the BIOS ROM to system RAM for faster execution.

The settings are *Enabled* or *Disabled.* The Optimal default setting is *Enabled.* The Fail-Safe default setting is *Disabled.*

C000,16K Shadow

C400,16K Shadow

C800,16K Shadow

CC00,16K Shadow

D000,16K Shadow

D400,16K Shadow

D800,16K Shadow

DC00,16K Shadow

These options control the location of the contents of the 16KB of ROM beginning at the specified memory location. If no adaptor ROM is using the named ROM area, this area is made available to the local bus. The settings are:

Setting	Description
Shadow	The contents of C0000h - C3FFFh are written to the same address in system memory (RAM) for faster execution.
Cache	The contents of the named ROM area are written to the same address in system memory (RAM) for faster execution, if an adaptor ROM will be using the named ROM area. Also, the contents of the RAM area can be read from and written to cache memory.
Disabled	The video ROM is not copied to RAM. The contents of the video ROM cannot be read from or written to cache memory.

The default setting is *Cache*.

In the AMIBIOS for the Intel Triton chipset, the E000h page is used as ROM during POST, but shadowing is disabled and the ROM CS# signal is disabled to make the E000h page available on the local bus.

Chipset Setup

External Cache Wait State

This option selects the wait state used by WinBIOS and the computer for L2 (external) secondary cache memory. The settings are 0wait state or 1wait state.

8-Bit I/O Recovery Time (SYSCLK)

This option specifies the length of the delay (in SYSCLKs) inserted between consecutive 8-bit I/O operations. The settings are *1, 2, 3, 4, 5, 6, 7,* or *8.* The Optimal and Fail-Safe default settings are *2*.

16-Bit I/O Recovery Time (SYSCLK)

This option specifies the length of the delay (in SYSCLKs) inserted between consecutive 16-bit I/O operations. The settings are *1, 2, 3, 4, 5, 6, 7,* or *8.* The Optimal and Fail-Safe default settings are *2*.

PCI/PnP Setup

PCI/PnP Setup options are displayed by choosing the PCI/PnP Setup icon from the WINBIOS Setup main menu. All PCI/PnP Setup options are described in this section

Plug and Play Aware OS

Set this option to *Yes* if the operating system installed in the computer is Plug and Play-aware. AMIBIOS only detects and enables PnP ISA adapter cards that are required for system boot. The Windows 95 operating system detects and enables all other PnP-aware adapter cards. Windows 95 is PnP-aware. Set this option to *No* if the operating system (such as DOS, OS/2, Windows 3.x) does not use PnP. *You must set this option correctly or PnP-aware adapter cards installed in your computer will not be configured properly.* The settings are *No* or *Yes.* The Optimal and Fail-Safe default settings are *No.*

PCI Latency Timer (in PCI Clocks)

This option sets latency of all PCI devices on the PCI bus. The settings are in units equal to PCI clocks. The settings are *32, 64, 96, 128, 160, 192, 224,* or *248.* The Optimal and Fail-Safe default settings are *64.*

PCI VGA Palette Snoop

This option must be set to *Enabled* if any ISA adapter card installed in the computer requires VGA palette snooping. The settings are *Disabled* or *Enabled.* The Optimal and Fail-Safe default settings are *Disabled.*

Onboard PCI VGA

When this option is enabled, the system utilizes the onboard VGA adapter. If this option is disabled, the system will ignore the onboard adapter and search for an add on graphics card.

IRQ3

IRQ4

IRQ5

IRQ7

IRQ9

IRQ10

IRQ11

IRQ12

IRQ14

IRQ15

These options specify the bus that the named interrupt request lines (IRQs) are used on. These options allow you to specify IRQs for use by legacy ISA adapter cards.

These options determine if AMIBIOS should remove an IRQ from the pool of available IRQs passed to BIOS configurable devices. The available IRQ pool is determined by reading the ESCD NVRAM. If more IRQs must be removed from the pool, the end user can use these PCI/PnP Setup options to remove the IRQ by assigning the option to the *ISA/EISA* setting. Onboard I/O is configurable by AMIBIOS. The IRQs used by onboard I/O are configured as *PCI/PnP.*

The settings are *PCI/PnP* or *ISA/EISA*. The Optimal and Fail-Safe default settings are *PCI/PnP*.

Reserved Memory Size

This option specifies the size of the memory area reserved for legacy ISA adapter cards.

The settings are *Disabled, 16K, 32K*, or *64K.* The Optimal and Fail-Safe default settings are *Disabled.*

Reserved Memory Address

This option specifies the beginning address (in hex) of the reserved memory area. The specified ROM memory area is reserved for use by legacy ISA adapter cards.

The settings are *C0000, C4000, C8000, CC000, D0000, D4000, D8000,* or *DC000*. The Optimal and Fail-Safe default settings are *C0000.*

DMA Channels

This option can be used to reserve a DMA channel for use by legacy ISA adapter cards. The settings are *Disabled, DMA Ch1, DMA Ch 3, DMA Ch 5, DMA Ch 6,* or *DMA Ch 7*. The Optimal and Fail-Safe default settings are *Disabled.*

Peripheral Setup

Peripheral Setup options are displayed by choosing the Peripheral Setup icon from the WINBIOS Setup main menu. All Peripheral Setup options are described in this section.

Onboard FDC

This option enables the floppy drive controller on the motherboard. The settings are *Enabled* or *Disabled.* The Optimal default setting is *Enabled.* The Fail-Safe default setting is *Disabled.*

Onboard Serial Port1

This option enables serial port 1 on the motherboard and specifies the base I/O port address for serial port 1.

The settings are *3F8h, 3E8h,* or *Disabled.* The Optimal default setting is *3F8h*. The Fail-Safe default setting is *Disabled.*

Onboard Serial Port2

This option enables serial port 2 on the motherboard and specifies the base I/O port address for serial port 2.

The settings are *2F8h, 2E8h,* or *Disabled.* The Optimal default setting is *3F8h*. The Fail-Safe default setting is *Disabled.*

Onboard Parallel Port

This option enables the parallel port on the motherboard and specifies the parallel port base I/O port address. The settings are *378h, 278h,* or *Disabled.*

The Optimal default setting is *378h.* The Fail-Safe default setting is *Disabled.*

Parallel Port Mode

This option specifies the parallel port mode. ECP and EPP are both bidirectional data transfer schemes that adhere to the IEEE P1284 specifications. The settings are:

Setting	Description
Normal	The normal parallel port mode is used. This is the default setting.
Bi-Dir	Use this setting to support bidirectional transfers on the parallel port.
EPP	The parallel port can be used with devices that adhere to the Enhanced Parallel Port (EPP) specification. EPP uses the existing parallel port signals to provide asymmetric bidirectional data transfer driven by the host device.
ECP	The parallel port can be used with devices that adhere to the Extended Capabilities Port (ECP) specification. ECP uses the DMA protocol to achieve transfer rates of approximately 2.5 Mbs. ECP provides symmetric bidirectional communications.

Parallel Port DMA

This option is only available if the setting for the **Parallel Port Mode** option is *ECP.*

The settings are *Disabled, DMA CH (channel) 0, DMA CH 1,* or *DMA CH 3*. The default setting is *Disabled.*

Onboard PCI IDE

This option specifies the onboard IDE controller channels that will be used. The settings are *Primary, Secondary, Both*, or *Disabled.* The Optimal and Fail-Safe default settings are *Primary.*

Onboard Parallel Port IRQ

Sets parallel port to IRQ 5 or 7.

Section 2: Security

Three icons appear in this part of the WINBIOS Setup screen:

- Supervisor (Password),
- User (Password), and
- Anti-Virus.

Two Levels of Passwords

Both the Supervisor and the User icons configure password support. If you use both, the Supervisor password must be set first.

The system can be configured so that all users must enter a password every time the system boots or when WINBIOS Setup is executed, using either or both the Supervisor password or User password.

AMIBIOS Password Support

The Supervisor and User icons activate two different levels of password security.

If WINBIOS Setup has an optional password feature. The system can be configured so that all users must enter a password every time the system boots or when WINBIOS Setup is executed.

Setting a Password

The password check option is enabled in Advanced Setup (see page **Error! Bookmark not defined.** by choosing either *Always* (the password prompt appears every time the system is powered on) or *Setup* (the password prompt appears only when WINBIOS is run). The password is encrypted and stored in NVRAM.

As shown on the above screen, you are prompted for a 1 – 6 character password. You can either type the password on the keyboard or select each letter of the password, one at a time, using the mouse. The password does not appear on the screen when typed. Make sure you write it down. If you forget it, you must drain NVRAM and reconfigure.

If You Do Not Want to Use a Password

Press <Enter> when the password prompt appears.

Changing a Password

Select the *Supervisor* or *User* icon from the Security section of the WINBIOS Setup main menu. Enter the password and press <Enter>. The screen does not display the characters entered. After the new password is entered, retype the new password as prompted and press <Enter>.

If the password confirmation is incorrect, an error message appears. If the new password is entered without error, press <Esc>. The password is stored in NVRAM after WINBIOS completes. The next time the system boots, a password prompt appears if the password function is present and enabled.

Remember the Password

Keep a record of the new password when the password is changed. If you forget the password, you must erase the system configuration information in NVRAM (Non-Volatile Random Access Memory).

Anti-Virus

When this icon is selected from the Security section of the WINBIOS Setup main menu, AMIBIOS issues a warning when any program (or virus) issues a Disk Format command or attempts to write to the boot sector of the hard disk drive. The settings are *Enabled* or *Disabled.* If enabled, the following appears when a write is attempted to the boot sector. You may have to type *N* several times to prevent the boot sector write.

```
Boot Sector Write!!!

Possible VIRUS: Continue (Y/N)? _
```

The following appears after any attempt to format any cylinder, head, or sector of any hard disk drive via the BIOS INT 13 Hard Disk Drive Service:

```
Format!!!
Possible VIRUS: Continue (Y/N)? _
```

Section 3: Utility

The following icon appears in this section of the WINBIOS Setup main screen:

Detect IDE

If you select Detect IDE, WinBIOS automatically finds all IDE hard disk drive parameters. WinBIOS places the disk drive parameters that it finds in the Master Disk Type or Slave Disk Type fields in Standard Setup.

Section 4: Default

The icons in this section permit you to select a group of settings for all WINBIOS Setup options. Not only can you use these icons to quickly set system configuration parameters, you can choose a group of settings that have a better chance of working when the system is having configuration-related problems.

Original

Choose the Original icon to return to the system configuration values present in WINBIOS Setup when you first began this WINBIOS Setup session.

Optimal

You can load the optimal default settings for the WINBIOS by selecting the Optimal icon. The Optimal default settings are best-case values that should optimize system performance. If NVRAM is corrupted, the Optimal settings are loaded automatically.

Fail-Safe

You can load the Fail-Safe WINBIOS Setup option settings by selecting the Fail-Safe icon from the Default section of the WINBIOS Setup main menu.

The Fail-Safe settings provide far from optimal system performance, but are the most stable settings. Use this option as a diagnostic aid if the system is behaving erratically.

Appendix A: AMIBIOS Identification Strings

AMIBIOS stores three strings of information that identify system BIOS options. Identification String 1 appears at the bottom of the screen during system boot. The BIOS Identification string bytes are numbered consecutively from left to right.

Press <Ins> during system boot to display Identification Strings 2 and 3.

Identification String Line 1

The AMIBIOS ID String 1 format is:

Byte	Description
1	Processor Type 0 8086 or 8088 2 80286 3 80386 4 80486 5 Pentium 6 Pentium Pro
2	Size of BIOS 0 64 KB 1 128 KB
4–5	Major Version Number
6–7	Minor Version Number
9–14	Reference Number
16	Halt on POST Error. Set to 1 if On.
17	Initialize CMOS in every boot. Set to 1 if On.
18	Block pins 22 and 23 of the keyboard controller. Set to 1 if On.
19	Mouse support in system AMIBIOS or keyboard controller. Set to 1 if On.
20	Wait for <F1> if error found. Set to 1 if On.
21	Display Floppy error during POST. Set to 1 if On.
22	Display Video error during POST. Set to 1 if On.
23	Display Keyboard error during POST. Set to 1 if On.
25–26	BIOS Date. Month (1-12).
27–28	BIOS Date. Date (1-31).
29–30	BIOS Date. Year (0-99).
32–39	Chipset Identification. BIOS Name.
41	Keyboard controller version number.

Identification String Line 2

Byte	Description
1–2	Pin number for clock switching through keyboard controller.
3	Indicates High signal on pin switches clock to High(H) or Low (L).
5	Clock switching through chipset registers 0 No clock switching through chipset registers. 1 Clock switching through chipset registers.
7–10	Port address to switch clock high through special port.
12–13	Data value to switch clock high through special port.
15–16	Mask value to switch clock high through special port.
18–21	Port Address to switch clock low through special port.
23–24	Data value to switch clock low through special port.
26–27	Mask value to switch clock low through special port.
29–31	Turbo Switch Input Pin information (Pin number for Turbo Switch Input Pin).

Identification String Line 3

Byte	Description
1–2	Keyboard Controller Pin number for cache control.
3	Keyboard Controller Pin number for cache control. Indicates whether High signal on the pin enables (H) or disable (L) cache.
5	1 The High signal is used on the Keyboard Controller pin.
7–9	Cache Control through Chipset Registers: 0 Cache Control off 1 Cache Control on
11–12	Port Address to enable cache through special port.
14–15	Data value to enable cache through special port.
17–20	Mask value to enable cache through special port.
22–23	Port Address to disable cache through special port.
25–26	Data value to disable cache through special port.
28–29	Mask value to disable cache through special port.
31	Reset memory controller Pin number for Resetting the 82335 Memory controller.
33	BIOS Modified Flag Incremented each time AMIBIOS is modified, from 1 to 9, then from A to Z, and then reset to 1. 0 AMIBIOS has not yet been modified. 1 AMIBIOS has been modified.

Appendix B: Display Drivers and Utilities
User Guide

Notice

CIRRUS LOGIC, Inc. believes the information contained in this document is accurate and reliable. However, CIRRUS LOGIC, Inc. reserves the right to make corrections, improvements, or changes to this manual at any time and without notice. No responsibility is assumed by CIRRUS LOGIC, Inc. for its use; nor for infringements of patents or other rights of third parties. This document implies no license under patents or copyrights, other than those explicitly stated.

Trademarks

Contents

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Chapter 1: Introduction

This manual provides operating instructions for user utilities and installation instructions for the display drivers supplied with your SB486PV VGA.

The SB486PV VGA graphics system is VGA compatible. The utilities and drivers supplied with your SB486PV VGA provide support for additional features of your SB486PV VGA, such as greater speed, higher resolution, and more available colors.

Before you begin

The following instructions assume that the user is familiar with DOS and certain DOS commands. Please review the associated DOS commands before performing the installation.

Notational conventions

Throughout this manual, the term 'DOS' refers to both MS-DOS and PC-DOS, except when noting features that are unique to one or the other.

Table 1 shows the typographic conventions that are used throughout this manual:

Type Style	Description
User Input	This text must be typed exactly as it appears. Text within brackets indicates certain keyboard keys (such as [Enter], [F10],etc).
Bold	Sytem output. Any message that is displayed by the computer.
ALL CAPITALS	Directory names, files and acronyms.

Table B-1: Notational conventions

Easy installation

The installation utility is provided to facilitate the smooth installation of the display drivers and utility software. The installation program is menu-driven and allows you to select and install only those display drivers for software and applications currently in use.

It is important to note that some display drivers need to have the associated vendor's application program already installed on the system prior to loading the SB486PV VGA display drivers. In other cases, the loading of the display driver may be an integral part of the vendor's product installation process. Please review the driver product section below for specific instructions prior to running the installation program.

The installation utility is located on the diskette labeled Disk 1. To install the desired display drivers and utilities, insert the diskette into the A: drive, type

```
A:[Enter]
INSTALL[Enter]
```

Follow the instructions on the screen to install the listed display drivers. At any time you may press [Esc] to abort the installation process and go back to DOS.

Selected drivers are simply copied to the specified disk and directory. Applications may require additional installation as described in the Display drivers section of this manual.

Operation

If you have followed the installation instructions in this manual, you are now ready to use your SB486PV VGA equipped computer system. Most software that is compatible with IBM's Personal System/2, VGA or EGA will run automatically on your system using the VGA Card. Just turn on your computer system and install your application package for PS/2 model 50, 60 or 80 video, VGA, or EGA as instructed by the software manufacturer.

FCC information

Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

This device complies with Part 15 of FCC Rules. 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.

Notice to user: Changes or modifications to this product not approved by the party responsible for FCC compliance could void your authority to operate this equipment.

In order for an installation of this product to maintain compliance with the limits for a Class B device, shielded cables must be used for the connection of any devices external to this product.

Utility software

There are utility programs which are supplied with your SB486PV VGA. The following section describes these utilities and how to use them.

CLMode is a program supplied with your SB486PV VGA to configure it's various options.

The TSRFONT utility will make a full 8x14 size character set available to programs that bypass the BIOS and directly draw characters to the screen.

WinMode lets the user change the operating resolution and the number of colors from within Windows. Information on WinMode can be found in the Windows 3.X section.

CLMode

The CLMode utility allows the user to define the type of monitor attached, set the video mode timings supported by the SB486PV VGA and preview them.

Note that to use a mouse, a mouse driver should be installed prior to running the CLMode utility.

Using CLMode's graphic interface

CLMode requires that the computer have 300KB of standard memory and 10MB of extended or expanded memory available for it to run. At the DOS prompt type:

CD WINDOWS, then CD VGAUTIL, then CLMODE[Enter].

When CLMode starts, it will blank the screen for a couple of seconds. During this time, CLMode is attempting to identify the monitors capabilities using the VESA Display Data Channel (DDC). In its graphics mode, CLMode looks and works just like a Windows application.

The main window is used to select and configure the monitor that you have connected to the graphics adapter. Select the brand and model of the current monitor using the two dropdown boxes. To get a scrollable list of available choices, click on the down arrow with the mouse. For keyboard only, hit the [Tab] key until the Monitor Brand field is highlighted, and use the cursor keys to move through the choices. If the correct brand is not available select 'Other Brand'. Move to the 'Monitor Model' field and select from the list provided. If 'Other Brand' was selected then the only choice will be 'Other Monitor'. If the monitor is not on the list select "Other Model".

If the graphics adapter and the monitor both support VESA Display Data Channel, this will be the default choice. This means that CLMode was able to identify the monitor and knows what resolutions and refresh rates are available for the monitor.

Select the refresh rate for each resolution. If the monitor was selected by name, then selecting the highest refresh for each resolution will give the highest quality display. If 'Other Brand' or 'Other Model' was chosen, consult the manual that came with the monitor to determine the proper refresh rates.

At the bottom of the screen are six buttons. Each button represents a different option or window. The underlined letter of a button name specifies the hot key combination for that item. For example, press the [Alt] and the underlined letter keys simultaneously.

In the lower right corner of the main window is configuration information about the graphics system. The information details the VGA BIOS version, the total display memory of the graphics controller, whether or not an EEPROM is present, and whether or not a centering TSR is loaded. This information is useful when installing software or getting technical support.

Preview video modes

Select the Preview button. The Video Modes Preview window displays a list of all of the modes supported based on the currently selected monitor timings and the amount of video memory present. This list of video modes will tell you which are available in your current configuration for use with extended resolution drivers. To see what different video modes look like on your monitor, select the Show button. After each test screen is displayed, press [Enter]. If you don't want to see any more video modes pressing [Esc] will return you to the Video Modes Preview window.

Centering adjust

Centering is available while in Video Modes Preview (only for extended Graphics modes 58h and greater). While previewing a video mode, you have the option to use the Right/Left/Up/Down arrow keys to adjust your screen accordingly. The screen adjustments have predefined limits, and in some cases, the limit for the right side adjustment for some modes will have already been reached when entering the Preview mode. In that case, no right side adjustment will be allowed. Once a mode has been adjusted, the new values for horizontal and/or vertical positioning are saved within CLMode. When exiting from CLMode, you are prompted on whether you want to save these new parameters to the TSR (CENTER.COM). If you choose to do this, the values to be used for the adjusted modes are stored in CENTER.COM on exit. CENTER.COM can then be loaded outside of CLMode. Once this is accomplished, all of the modes which you have adjusted will be the active modes set when that mode request is made. To unload CENTER.COM, you must change the monitor type currently set in CLMode. This will unload CENTER.COM and uninstall all centering adjustments previously redefined.

An additional adjustment for monitor SYNC POLARITY is also available while centering is active. To adjust the polarity of the current mode, simply press the PgUp or PgDn keys (while in Preview) to cycle through the available options, (Vertical Sync Polarity/Horizontal Sync Polarity):

```
+/+,  +/-,  -/+,  -/-
```

Note: Centering will not be allowed if CENTER.COM has been loaded. You must unload CENTER.COM before attempting to save new adjustments.

Limitations: You may only adjust and save 16 modes at a time to CENTER.COM.

The information in the main window displays the VGA controller type, the BIOS version number, and the amount of video memory present.

Getting help

Selecting the **Help** button from the main window will display instructions on using CLMode.

Information about CLMode

Selecting the **About** button will display version and copyright information about CLMode.

Undoing changes

To return all settings to their state when CLMode was started, select the **Undo** button.

Exiting the CLMode

To exit CLMode at any time, press the [Alt] and [F4] keys simultaneously, or click the left mouse button on the system button of the main window (i.e., the top left corner button of the window which is shown as a dot), or select the **Exit** button.

Some boards are equipped with an EEPROM. This is memory that will not be erased when the computer is turned off. If the EEPROM is present, then CLMode will save its configuration information in the EEPROMs memory. If there is no EEPROM, CLMode will ask if the changes should be saved in the AUTOEXEC.BAT. In most cases, the end user should answer yes. Answering no means that the next time the computer is booted, all of CLMode's configuration information will be lost.

When the CLMode utility exits, the currently selected monitor brand, model, timings, and centering information will be saved. The current monitor timings will be displayed.

Using CLMode's command line options

When command line options for CLMODE.EXE are given at the DOS prompt, the menu-driven windows will not be displayed. Instead, configuration, monitor type, video mode and refresh rate will be set at the DOS prompt. To display the available command line syntax for CLMode, type:

> CLMODE /?[Enter]

Typing an invalid option will display the command line help text. Typing [S] as a command line option will display the current CLMode settings.

TSRFONT driver

Some DOS application programs bypass the BIOS and directly draw characters to the screen. Programs which directly draw characters using the 8x14 font from the BIOS will appear to be writing incorrect data to the screen. Typically this can occur in programs which offer a selection to use a graphics 25 or 34 line display mode. Other programs may appear to cut off the descenders of characters like "y" and "j".

Running the TSRFONT driver will make a full 8x14 size character set available to these programs, and should correct display errors discussed above which were observed in these programs.

To run the TSRFONT driver, type TSRFONT [Enter]. If you want to run it automatically when you turn on your computer, add it to your AUTOEXEC.BAT file.

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Chapter 2: Microsoft Windows 3.X

Windows 3.X installation

The Windows 3.X driver installation utility copies all of the graphics driver and utility files to your hard disk. It also allows you to configure your graphics system for Windows 3.X in either DOS or original OS/2 v2.1 (see Note below). You can change the monitor refresh rates, resolution, number of available colors, large or normal size fonts and font cache size.

After new options have been selected, you can either immediately restart Windows, in which case the new configuration will take effect immediately, or you can continue working in the current resolution, in which case the new resolution will take effect the next time Windows is started. In some configurations the AUTOEXEC.BAT file needs to be modified to make the changes permanent.

The display drivers support both Windows versions 3.1 and 3.11 and also Windows for Workgroups version 3.11. Because these drivers were written and optimized for performance, they were written to use a linear address for the display buffer and run in protected mode. To load the display drivers with Windows 3.11 or Windows for Workgroups 3.11, you must install the VGA driver first before installing these display drivers. The display drivers will only run in enhanced mode and not in standard mode.

Original OS/2 2.X is non-upgraded to support high color and true color display drivers. To upgrade to support high color and true color for OS/2 2.X, see page B-40.

Using Install

To run the installation program, start Windows 3.X. Insert the floppy labeled 'Windows 3.X Display Drivers and Utilities - Disk 1' into your floppy disk drive. From the Windows Program Manager select **Run** from the **File** menu. Type the letter of the floppy drive that the driver diskette is in, followed by the word install. For instance, if the driver disk is in drive A:, type A:\INSTALL.EXE. Click on the **OK** button.

In the first dialog box that is displayed, you can set the path where you would like the utility programs to be installed. If you want to use the default directory, click on **Continue**. To change to another directory, you can either type the path name or you can click on the down arrow and select a directory for installation. The drop down box works just like the **Directory** field in a file open dialog box. After you select the directory, press the **Continue** button.

After the drivers have been copied to your hard disk, the install program will execute the WinMode utility. See the section of this manual documenting WinMode for complete instructions on using this program.

After the extended resolution drivers and utilities have been installed, they can be reconfigured from within Windows 3.X using Windows Setup, WinMode, or from the DOS prompt.

Resolution

These buttons let you choose the resolution that WinMode will use to run Windows 3.X after Windows is restarted. Some of these buttons may be unavailable because of the amount of video memory in your system or if some of the monitor refresh rates have been set to **Unavailable**.

Colors

These buttons let you choose the number of colors that will be available to Windows 3.X after Windows is restarted. Some of these choices may be unavailable. This is because of the amount of video memory in your system and the resolution that you have selected. If you have chosen **OS/2 v2.1** in the **Operating System** field, then the only possible choices are for 16 or 256 colors. Generally, 256 color mode will be the fastest choice. If you need more colors then there will be some slowdown in graphics performance.

Font Size

The small fonts are intended for lower resolutions and higher resolutions on large monitors. With smaller monitors, the large fonts are more readable at higher resolutions.

Monitor Refresh Rates

The drop down list boxes let you select the monitor refresh rates for each resolution. If you select **Unavailable** for any screen resolution, any higher resolutions will also be unavailable. This will also turn off the corresponding choices in the **Resolution** box.

In general, the higher the refresh rate, the better the display quality and the lower the performance. This is because the graphics system can only do a fixed number of operations per second. The more time it spends redrawing the screen, the less time it has available to perform other operations.

Consult the manual that came with your monitor to determine the proper settings for these fields.

Font Cache Size

The **Font Cache Size** lets you set the amount of system memory that will be available for font caching.

Next to the font cache size is an up arrow and a down arrow. Click on the up arrow to increase the cache size. Click on the down arrow to decrease the cache size.

Font caching is a technique to increase the performance of Windows by saving the bitmaps of frequently used characters. Normally, when a character is displayed on the screen it first is created from the truetype outline then it is copied to the screen. A cached character has already been created and stored and so it is just copied as needed.

WinMode has tried to determine the correct setting for this field for you, but you may change it. Just remember that memory set aside for font caching will not be available for Windows program and system usage.

Operating System

The **Operating System** buttons let you set the operating system in which you are running Windows.

This is very important because the configuration and capabilities of the drivers are very different in OS/2 v2.1 and DOS. The most obvious difference is that the drivers will only work in 16 and 256 color modes in OS/2. There are a number of other differences in the configuration of the drivers.

Prior to installing OS/2 For Windows, you will need to run WinMode and select the OS/2 v2.1 option.

OK

The **OK** button closes the dialog box and accepts the choices that you have made.

After clicking **OK**, your computer will be reconfigured to use the choices that you have made. These changes may need to be added to your AUTOEXEC.BAT file for them to be permanent. If this is necessary, you will be prompted by the program.

If WinMode detects that you have changed your Windows 3.X configuration, you will be asked if Windows should be restarted. If you answer yes, Windows will be restarted immediately. If you answer no, you can continue to use Windows, however the changes will not take effect until Windows is restarted.

Cancel

The **Cancel** button closes the dialog box and exits the program without making any changes. Selecting **Close** from the control menu or double clicking on the control menu box will have the same effect.

About

The **About** button will display a dialog box with the version number of WinMode and a copyright notice.

Help

For help on WinMode, select the **Help** button. The main help screen contains an image of the WinMode screen. Place the cursor over the field(s) that you need help with. When the mouse pointer changes to a hand, click to display the help text for that field. Click again to make the pop-up text disappear.

After the extended resolution drivers and utilities have been installed, they can be reconfigured either from within the Windows 3.X Control Panel or from the DOS prompt.

Reconfiguring Windows 3.X

If you are in Windows, run WinMode to reconfigure the Windows 3.X drivers. Please refer to the Utility software section for information on WinMode.

If you are in DOS, proceed as follows to reconfigure the Windows 3.X drivers.

1. Ensure that Windows 3.X and the extended resolution drivers are already installed on your computer.

2. From your Windows directory, at the DOS prompt, type SETUP[Enter] to run the Windows SETUP.EXE program. Follow the instructions on the screen. When you come to the screen which lists the hardware and software components such as display adapter (e.g. VGA, CGA, etc.), keyboard type, mouse type, etc., go to the **Display** selection by using cursor keys to move the highlighted bar and press [Enter].

3. You will see the list of drivers and their associated resolutions.

4. Highlight the desired choice by moving the cursor to the correct display driver, and then press [Enter].

5. Setup will prompt you that the driver is already in your Windows directory and give you a chance to replace it. Use the existing driver.

6. Continue with the remainder of the setup procedure.

To turn on/off DDC detection support

To turn the DDC detection support on or off, the following changes need to be made to the WINMODE.INI file.

To turn on DDC detection support:

```
MakeDdcCall=on
```

To turn off DDC detection support:

```
MakeDdcCall=off
```

To turn on/off resolution-change-on-the-fly support

To turn the resolution-change-on-the-fly support on or off, the following changes need to be made to the WINMODE.INI file.

To turn on resolution-change-on-the-fly support, locate the following line in the WINMODE.INI file and change the last word in the line to 'on':

```
system.ini,CL_WinAccel,changeres:lin=$winmode.ini,Configuration,changeres,on
```

To turn off resolution-change-on-the-fly support, locate the following line in the WINMODE.INI file and change the last word in the line to 'off':

```
system.ini,CL_WinAccel,changeres:lin=$winmode.ini,Configuration,changres,off
```

Windows NT

Windows NT drivers are available on request from our Technical Support department at 1 800 480 0044. After receiving the needed drivers, follow the instructions below for your specific version of Windows NT.

Windows NT 3.1

Windows NT 3.1 display drivers installation:

1. Start Windows NT.
2. From the **MAIN** window of the **Program Manager** run the Windows NT Setup program.
3. Select **Change Systems Settings** from the **Options** menu of **Setup**.
4. Click on the down arrow at the right side of the DISPLAY: line. Scroll to the end of the list of available display drivers and select **OTHER** display (requires disk from hardware manufacturer).
5. Insert the Windows NT display driver diskette into drive A: and type A:\[Enter] as the pathname, then click on **OK**.
6. You will see the list of available drivers, their associated resolution and monitor refresh rates.
7. Highlight by moving the cursor to the desired display driver, click on **OK**, and then click on **Close**.
8. Continue with the remainder of the setup procedure. The changes will not take effect until the computer is restarted.
9. After you have installed the Windows NT driver, to select another display resolution, follow steps 2 and 3 above, then click on the down arrow on the right side of the DISPLAY: line to select the desired resolution from the list of available display drivers.

Note: These Windows NT drivers only support systems or video adapters with 1MB of DRAM or more.

Windows NT 3.5

Windows NT 3.5 display drivers installation:

1. Select **Control Panel** from the **Main** group.
2. Select the **Display** icon.
3. Select **Change Display Type**.
4. Select **Change** from the **Adapter Type** area.
5. Select **Other**.
6. Place the Windows NT 3.5 Installation Disk into Drive A.
7. Select **Install** and click **"Yes"** when the Installing Driver dialog box appears.
8. When the Windows NT **Setup** dialog box appears, select drive A, and click **"Continue"**.

A message will appear stating that the drivers were successfully installed. Click **"OK"**. You must now restart Windows NT 3.5.

Selecting resolution and color depth:

1. Select **Control Panel** from the **Main** group.

2. Select **Display** icon.

3. Select **Color Palette** to change between 16 colors, 256 colors and 65536 colors.

4. To select desktop resolution size, go to the **Desktop** area and use the slide bar to change resolution from 640x480, 800x600, 1024x768, and 1280x1024.

5. Select **Test** to test the resolution. If the display test screen was good then select **"Yes"** when the **Test Mode** dialog box appears. If the display test screen was bad then select **"No"**. Windows NT will give you an error message.

6. If the display screen was good and you selected **"Yes"**, Windows NT 3.5 will prompt you to restart Windows NT 3.5.

WinMode

The WinMode utility configures your graphics system for Windows 3.X in either DOS or original OS/2 2.1. It allows the user to change the monitor refresh rates, resolution, number of available colors, large or normal size fonts and font cache size.

After new options have been selected, the user can either immediately restart Windows, in which case the new resolution will take effect immediately, or continue working in the current resolution, in which case the new resolution will take effect the next time Windows is started. In some configurations the AUTOEXEC.BAT file needs to be modified to make the changes permanent.

WinMode assumes that the Windows drivers have been correctly installed and configured using installation utility provided on the Windows 3.X Drivers and Utilities Diskette.

For installation instructions see the section on Windows 3.X drivers in this manual.

Using WinMode

WinMode is run by selecting it's icon. The icon will be in the group that you specified during the install process. When WinMode is started the screen may blank for up to two seconds. This happens while WinMode attempts to discover the capabilities of the monitor. If this is successful, you will see only one choice besides the other brand and model choices in the Monitor Brand and Monitor Model drop down combo boxes.

The various sections are described below.

Monitor brand

Select the brand of your monitor from the list provided in the drop down box. This will change the list of monitors in the Monitor Model drop down box to display only the models available under the selected brand. If your monitor brand is not listed, select Other Brand.

If your graphics adapter and monitor both support VESA Display Data Channel, this will be the default choice. This means that WinMode was able to identify the monitor and knows what resolutions and refresh rates are available for the monitor.

Monitor model

Select the current model from the list first presented. If your monitor is not listed select Other Monitor. If your graphics adapter and monitor both support VESA Display Data Channel, this will be the default choice. This means that WinMode was able to identify the monitor and knows what resolutions and refresh rates are available for the monitor.

Monitor refresh rates

The drop down list boxes let you select the monitor refresh rates for each resolution. If you select Unavailable for any screen resolution, any higher resolutions will also be unavailable. This will also turn off the corresponding choices in the Resolution box.

The only choices that will be available are the ones available to the monitor that was selected in the Monitor Brand and Monitor Model fields. If Other Brand or Other Model were selected then all of the refresh rates available on the graphics adapter will be listed. Consult the manual that came with your monitor to determine the best choices.

In general, the higher the refresh rate, the better the display quality and the lower the performance. This is because the graphics system can only do a fixed number of operations per second. The more time it spends redrawing the screen, the less time it has available to perform other operations.

Resolution

These buttons let you choose the resolution that WinMode will use to run Windows 3.X after Windows is restarted. Some of these buttons may be unavailable because of the amount of video memory in your system or if some of the monitor refresh rates have been set to Unavailable.

Colors

These buttons let you choose the number of colors that will be available to Windows 3.X after Windows is restarted. Some of these choices may be unavailable. This is because of the amount of video memory in your system and the resolution that you have selected. If you have chosen OS/2 v2.1 in the Operating System field, then the only possible choices are for 16 or 256 colors. Generally, 256 color mode will be the fastest choice. If you need more colors then there will be some slowdown in graphics performance.

Font size

The small fonts are intended for lower resolutions and higher resolutions on large monitors. With smaller monitors, the large fonts are more readable at higher resolutions.

Font cache size

The Font Cache Size lets you set the amount of system memory that will be available for font caching.

Next to the font cache size is an up arrow and a down arrow. Click on the up arrow to increase the cache size. Click on the down arrow to decrease the cache size.

Font caching is a technique to increase the performance of Windows by saving the bitmaps of frequently used characters. Normally, when a character is displayed on the screen it first is created from the Truetype outline then it is copied to the screen. A cached character has already been created and stored and so it is just copied as needed.

WinMode has tried to determine the correct setting for this field for you, but you may change it. Just remember that memory set aside for font caching will not be available for Windows program and system usage.

Operating system

The Operating System buttons let you set the operating system that you are running Windows in.

This is very important because the configuration and capabilities of the drivers are very different in OS/2 2.1 and DOS. The most obvious difference is that the drivers will only work in 16 and 256 color modes in OS/2 2.X. There are a number of other differences in the configuration of the drivers.

Prior to installing OS/2 For Windows, you will need to run WinMode and select the OS/2 2.1 option.

OK

The OK button closes the dialog box and accepts the choices that you have made.

After clicking OK, your computer will be reconfigured to use the choices that you have made. These changes may need to be added to your AUTOEXEC.BAT file for them to be permanent. If this is necessary, you will be prompted by the program.

If WinMode detects that you changed your Windows 3.X configuration, you will be asked if Windows should be restarted. If you answer yes, Windows will be restarted immediately, If you say no, then you will have to exit Windows and restart it manually for the changes to take effect.

Cancel

The Cancel button closes the dialog box and exits the program without making any changes. Selecting Close from the control menu or double clicking on the control menu box will have the same effect.

About

The About button will display a dialog box with the version number of WinMode and a copyright notice.

Help

For help on WinMode, select the Help button. The main help screen contains an image of the WinMode screen. Place the cursor over the field(s) that you need help with. When the mouse pointer changes to a hand, click to display the help text for that field. Click again to make the pop-up text disappear.

Power management screen saver

About the screen saver

The Display Power Manager for Windows 3.X provides a mechanism to control the amount of power used by a computer's monitor. It provides a total of 5 levels of power savings.

The first level is a conventional screen saver that turns the screen black and bounces a logo around. The black screen provides substantial power savings and the animation lets you know that the computer is still active.

The other four levels of power savings are...

Reduced on mode - Reduced on mode is an optional power saving state that allows the computer to use some power savings while still fully operational. Currently this is limited to some portable computers that can lower the power usage on their LCD displays. This causes some degradation of display quality.

Stand by mode - Stand by mode is an optional power saving state that gives minimal power savings, but provides the fastest recovery time.

Suspend mode - Suspend mode is a mandatory state in which substantial power savings are achieved by the display. The trade off is that recovery times are longer than from stand by mode.

Off mode - Off mode provides the highest level of power savings and the longest recovery times. With this mode the display is actually turned off so that recovery times are equivalent to switching the monitor on.

They match the power saving modes defined by the VESA VBE/PM (see below) standard. As you move down from one mode to the next, the amount of power being saved is greater, but so is the amount of time that it takes for a monitor to recover and be ready to display data.

The screen saver will cycle through all of the selected power saving modes one after another until the maximum selected power saving mode has been reached. The number of minutes that is specified for each level is the number of minutes after the previous mode has been enabled. It is not the total time before entering that mode.

Using the Windows Control Panel, select Desktop. In the group Screen Saver within the Desktop dialog box, select the Screen Saver named Display Power Manager. Select the desired delay before entering a power saving mode. Select Setup to further configure the power saving options. The following sections describe these options. For further information on setting up Windows screen savers, please refer to the Windows User Guide.

Special considerations

Some of these power saving modes are intended for specific display types, so not all of them are available on all video controllers. On some controllers, only the animated logo will be available.

For the power saving modes to have any effect beyond just blanking the screen, the monitor being used must have specific power saving features.

Note that if the screen saver is in any of the power saving modes, moving the mouse will not wake it up. This is different from normal screen savers and is used to keep the monitor from waking up because of accidents such as bumping the desk that the computer is sitting on. This is especially important if the password option is enabled, since once the password dialog box pops up, it stays there until the user turns it off. This is a limitation of the Windows 3.X screen saver interface.

Using the screen saver

When the screen saver is started, it will initially display a bouncing logo on a black background. To enable additional levels of power savings, select them from the **Screen Saver Mode** section of the **Setup** dialog box.

Screen saver mode

The **Screen Saver Mode** section has four check boxes in it. They are , , and . The screen saver detects the type of graphics controller that is being used and the types of power savings that it is capable of.

If the text immediately to the right of any of the check boxes is unavailable, that option is not available. If a power saving mode is available, then the text immediately to the right of the check box is black. If the box is selected with the mouse or the keyboard, the rest of the fields on the line will also turn black. If the check box is deselected, the other fields will turn gray.

The minutes field for each line can be changed only if the check box for that line is selected. The amount of time can be set for any number between 1 and 60. The number can either be typed directly, or by clicking on the up or down arrow next to the number. Holding the mouse button down on the arrow will quickly increase or decrease the minutes field.

The number of minutes that is specified for each level is the number of minutes after the previous mode has been enabled. It is not the total time before entering that mode.

Screen saver animation speed

The scroll bar controls how fast the animation moves. The checkbox controls whether or not a bouncing sound will be played whenever the logo hits an edge of the screen.

Password options

If the password checkbox is enabled, then the screen saver will prompt the user for a password before it quits. The password is the same one that is used for other Windows 3.X screen savers.

The Energy Star program

Energy Star is a program created by the US Environmental Protection Agency (EPA) to promote energy efficiency. The goal of this program is to lower electricity usage by making computers and related hardware more energy efficient.

Computers currently use an estimated 5% of commercial electricity consumption. If no actions are taken, this could rise to 10% by the year 2000. Ironically, much of this electricity is wasted. Research shows that the vast majority of time personal computers are on, they are not actively in use. Additionally 30% - 40% are left running at night and on weekends.

Electricity generation accounts for 35% of all U.S. emissions of carbon dioxide - the most prevalent greenhouse gas. It also accounts for 75% and 38% of all U.S. emissions of sulfur dioxide of nitrogen oxides respectively - the two pollutants most responsible for acid rain.

By using more energy-efficient equipment in our homes, offices and factories, we can reduce this pollution - while saving money.

The Energy Star logo is used to mark computers, peripherals and software that have adopted the EPAs power saving guidelines.

For more information on the Energy Star program contact

> Linda Latham, Manager
> Energy Star Computers
> U.S. EPA (6202J)
> Washington, DC 20460
> USA
> Phone: (USA) 202-233-9230
> Fax: (USA) 202-233-9578

VESA VBE/PM

The VESA VBE/PM is a software interface to the Video Electronics Standards Association (VESA) Display Power Management Signaling (DPMS) standard. For more information on VESA and these specifications contact them at:

> VESA
> 2150 North First Street
> San Jose, CA 95131-2029
> USA
> Phone: (USA) 408-435-0333
> Fax: (USA) 408-435-8225

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Chapter 3: Display drivers

The video controller is VGA compatible. The display drivers described in this manual are supplied to improve the resolution for each supported software application package.

It can support improved text resolution, providing greater readability when using the supplied drivers in text-based word processing programs. It also supports higher graphics resolutions, providing greater detail when using the supplied drivers in graphics-based programs.

In each application section, there will be a brief introduction describing the application and the revision level of the application supported by the supplied display drivers.

The installation instructions for each display driver will follow the introduction section. Follow the instructions carefully to be sure that each display driver is correctly installed. All of the installation instructions assume that the Driver Diskette is located in drive A:. If drive B: is used, the instructions should be changed appropriately.

The installation utility (INSTALL.EXE) should be used to copy display drivers directly to the appropriate application directories where they may be configured by the application software.

Before you begin

It is assumed that the user is familiar with DOS and certain DOS commands. Please review the installation instructions and the associated DOS commands before attempting the actual installation.

Not all video modes will be available on all systems. If an extended mode driver is installed for a video mode that is not available, the application program will not function properly. There are a number of things that determine the list of available video modes. Some of these include the current monitor type, the amount of installed memory, and the revision of the VGA controller. To determine which modes are available before beginning the driver installation, it is recommended that the user run the CLMode program and examine the list of available video modes.

Autodesk - ADI 4.2

The ADI 4.2 driver provided with your SB486PV VGA is the TurboDLD*Classic* display list driver from Panacea. It has only two purposes:

1. To speed up AutoCAD REDRAWs, PANs, and ZOOMs
2. To provide a more productive, user-friendly, interface to AutoCAD (via the features described later in this manual).

The driver is memory-resident and inserts itself between AutoCAD and the graphics board. It has no other effect on AutoCAD's operation besides speeding the program up; it runs with AutoShade 2 with RenderMan and 3D Studio to provide enhanced rendering support, but does not affect the speed of these programs, since they do not support Display Lists.

Installing TurboDLD*Classic* does not change any of the AutoCAD program files or alter any of the drawing files stored on disk. TurboDLD*Classic* was designed to be an easy-to-use, feature-filled product that makes using AutoCAD faster and more productive, not one that makes AutoCAD more complicated and difficult to use.

How does TurboDLD*Classic* make AutoCAD run faster? There are three things the driver does to speed operation:

1. AutoCAD stores drawings in a hierarchical structure, with simple elements intermixed with complex ones. Every time the screen is updated, AutoCAD must decode this structure. TurboDLD*Classic* works differently. While you are working, it translates the normal hierarchical structure into a Display List, a series of vectors or polygon fills. When you pan or zoom, TurboDLD*Classic* uses the Display List, then writes the resulting vectors to the video board hardware. Since the hierarchical structure does not have to be decoded, drawing proceeds very quickly.

2. TurboDLD*Classic* also maintains a Drawing Cache. The Drawing Cache is a compressed list which contains the current contents of a viewport. This pre-scaled portion of the Display List allows for even faster pans and zooms and redraws.

3. TurboDLD*Classic* gives you numerous new user-interface features, such as the bird's eye view. (via the features described later in this manual).

By how much does TurboDLD*Classic* increase the speed of AutoCAD? PANs and ZOOMs, aided by only the Display List, run from two to twelve times faster than a non-display list driver. The Drawing Cache further speeds things up to the point that REDRAWs can be up to twenty-five times faster with TurboDLD*Classic*, compared to the graphics drivers shipped with AutoCAD.Features

The features provided by TurboDLD*Classic* include:

*   Bird's eye view.

*   Accelerated redraws, pans, and zooms.

*   Easy to use - no new commands or special menus to learn.

*   Protected-mode ADI 4.2 driver - completely compatible with AutoCAD Release 12, Release 11/386, 3D Studio, Release 13 and AutoShade 2 with RenderMan.

*   No memory conflicts. Works with AutoCAD's built-in Virtual Memory Manager

*   Includes CustomColors™, which lets you interactively customize your logical and physical colors from within AutoCAD.

*   Completely compatible with all Autodesk ADI 4.2 compatible third party software.

*   Supports all AutoCAD Release 12 & 13 features, including rendering to viewports and 31-Bit regen space.

TurboDLD*Classic* requires a '386, '486 or Pentium based PC which supports AutoCAD Release 13, 12, 11/386, AutoShade 2 with RenderMan, or 3D Studio V1.x/2.x. Additional extended memory is recommended for optimal performance.

Quick start guide

This section summarizes the basics of installing and using TurboDLD*Classic*. Please read the rest of the manual for details.

What does it do?

TurboDLD*Classic* 's main function is to speed up AutoCAD pans, zooms and redraws. The driver accomplishes this by creating and maintaining a Display List - a fast-displaying object list of the current drawing - dramatically increasing performance on pans and zooms.

In addition to offering display list speed enhancement, TurboDLD*Classic* provides a bird's-eye view to allow you to move around large drawings.

What's the catch?

The only resource used by TurboDLD*Classic* is memory. The driver actively uses about 300Kbytes of RAM from extended memory for its operation. This memory is drawn from AutoCAD's memory pool and therefore does not affect normal DOS operation. The driver is loaded by AutoCAD at AutoCAD load time and is unloaded when AutoCAD is exited.

Additionally, the Display List size can vary from one tenth to three times the size of the current drawing file, particularly when using AutoCAD 12 & 13's 31-bit regen space.

You may wish to purchase and install additional RAM before installing TurboDLD*Classic*, since it shares memory with AutoCAD. If AutoCAD is using a lot of memory, TurboDLD*Classic* may not have enough. If there is significant hard disk activity while you are using TurboDLD*Classic*, it may be an indication that you should add more memory to your system.

Installation

Insert the driver diskette into Drive A: (or B:). Run the installation program (INSTALL.EXE), and choose the option for the Autodesk/AutoCAD drivers and specify the drive and directory where you want them copied to (such as C:\ACAD\DRV).

Since the start-up is a little bit different for AutoCAD Release 12 & 13 than it is for older versions, please follow the instructions for the version of AutoCAD you will be using TurboDLD*Classic* with.

To configure AutoCAD 12, 13

Begin AutoCAD with the reconfigure switch by typing

```
ACAD -R[Enter]
```

Choose option 3, **Configure Video Display** from the AutoCAD configuration menu.

Type **Y** at the **Do you want to select...** message to display the available video options for AutoCAD.

Select **TurboDLD Classic by Panacea Inc.** from the list of display options.

 If you chose to install TurboDLD*Classic* into a sub-directory other than ACAD\DRV, be sure to modify the ACADDRV environment variable to include that sub-directory. Otherwise, the TurboDLD*Classic* selection will not appear in the list of available drivers.

To configure AutoCAD 11/386

Run the FASTACAD.BAT that was copied to the TurboDLD*Classic* sub-directory by typing:

```
C:\TURBODLD\FASTACAD[Enter]
```

The above example shows that TurboDLD*Classic* was installed on drive C: in the TURBODLD sub-directory.

Start AutoCAD and reconfigure it to use TurboDLD*Classic* by selecting option 5, **Configure AutoCAD** from the AutoCAD main menu. From the next menu, select option 3, **Configure Video Display**. Choose Item 1, **P386 ADI 4.0/4.1** (R11) as your display device. (For more information, see your AutoCAD 'Installation and Performance Guide.')

TurboDLD*Classic* configuration

After selecting the proper display device, the TurboDLD*Classic* driver configuration menu will appear.

Set-up of TurboDLD*Classic* requires configuration of its various operating parameters. These parameters have been logically grouped into menus based on their interaction with AutoCAD. A quick trip through each menu will complete the configuration process. Context sensitive help can be obtained by typing [?] at any menu option. Please note that the DLDSETUP.HLP file must be present in order for help to appear. If you get an error message, be sure that the file DLDSETUP.HLP is in the ACAD\DRV sub-directory (R12), or in the TURBODLD sub-directory (R11).

If at any point during the configuration process you want to change an item on a previous screen, just press the [Esc] key to back up. Selecting **NO SAVE, EXIT** at the main configuration menu will return you to the AutoCAD configuration menu without making any changes.

At a minimum, a graphics board and screen resolution must be chosen from the **Select Graphics Board/Resolution** menu. If no display options are configured, the driver will be automatically configured for Generic VGA, 640 x 480 resolution at 16 colors.

The first menu, **Select Graphics Board/Resolution**, configures TurboDLD*Classic* for the graphics board, and display and rendering resolutions to be used. Prior to configuring TurboDLD*Classic*, run the CLMode utility and check the first screen to determine which chip and how much memory is on your VGA adapter.

• **Select Graphics Board** - Selects the graphics chip being used

• **Select Display Resolution** - Selects AutoCAD, 3D Studio and AutoShade main display screen resolutions

• **Select Rendering Resolution** - Selects AutoCAD 12, 13, 3D Studio and AutoShade rendering resolutions

When configuring TurboDLD*Classic*'s display options, the Rendering Board/Resolution options described below will automatically appear ONLY when configuring AVE Render, 3D Studio or AutoShade. Otherwise, the Display Board/Resolution options will be the only menu choices available.

Basic Configuration options set AutoCAD screen characteristics, number of text lines in the command-line area, font size and dual screen mode.

- **AutoCAD Text Lines** - Selects number of lines in AutoCAD command prompt area. The default is 3 lines, but values from 1 to 10 can be specified. A number larger than 3 might be useful if you are using this driver in a high resolution mode with small fonts, eliminating the need to frequently swap back and forth between the text and graphics screens.

If you do not want any lines of text at the bottom of the display, use AutoCAD to disable the command area (see the AutoCAD 'Interface, Installation and Performance Guide' for more information). Press [Return] to continue with font selection.

- **Font Size** - Selects AutoCAD display screen font or font file to be used. Choose the Font Size you would like to use for your AutoCAD menus, pull-downs, and dialog boxes: 8x8/8x14/8x16/12x20/12x24. For resolutions over 800x600 we recommend the 12x20 or 12x24 fonts. The default is the 8x14 font.
- **Dual Screen Mode** - Enables or disables dual screen operation of AutoCAD.

User Interface options include the parameters for maneuvering within AutoCAD. Using these options, the Big Picture, Panacea's bird's-eye view, can be configured to suit your needs or allow for better differentiation within a complex drawing.

- **Double Click** - The Double Click option allows you to set the delay for TurboDLD*Classic*'s Big Picture pop-up. This time represents the largest amount of time that can elapse between the release of the digitizer button and the subsequent press of the same button in order to detect a double click and display the Big Picture. Setting this number too low will result in the computer seeing two separate clicks, while setting the time too high may slow down response time for single button presses. Values between 10 and 30 are recommended.

The Double Click time is measured in hundredths of seconds. PC systems have a timing resolution of 5/100ths of a second, therefore, the entered time is rounded by the driver to the most closely approximate nearest multiple of 5. This means that a time setting of 23 is the same as a setting of 27, both of which get rounded to 25 (or one-quarter of a second). In simplest terms, when adjusting the timing value, it is best to use multiples of 5.

- **BP Button** - Sets mouse/digitizer button to use for Big Picture. With the BP Button option, TurboDLD*Classic* gives you the flexibility to use a double click on an available digitizer/mouse button as a Big Picture pop-up button. On the BP Button menu line, enter the number of any available digitizer button other than button 1 - button 1 is reserved as the pick button. Within AutoCAD, simply double click the chosen button to invoke the Big Picture.
- **BP Highlight Mode** - Controls how the Big Picture will appear on the screen. Patt Line will display the Big Picture using dotted lines to form the outer bounding box and the zoom crosshairs. XOR Rect will use a contrasting rectangle to display the Big Picture. The Both option will use a combination of Patt Line and XOR Rect to distinguish the Big Picture.

- **BP Refresh** - In it's fastest mode, TurboDLD*Classic* does not refresh the Big Picture until a DLDREFRESH command is issued. Depending on a drawing's complexity, in this mode, the Big Picture could become confusing, displaying vectors that are now actually erased, and no longer part of the drawing. To configure the Big Picture to be updated as objects are drawn or erased, enable the BP Refresh. If speed is a major concern, disable it.

- **BP Cache** - Enables or disables TurboDLD*Classic*'s internal memory cache for Big Picture functions. This cache will speed up Big Picture operations on some graphics platforms, primarily on TIGA-based graphics boards. For this reason, the BP Cache is normally disabled. As a reference, on VGAs, the performance benefit of the BP Cache is as little as 1%. With a TIGA-based graphics board, however, the performance benefit of the BP Cache is as high as 400%.

The **Expert Configuration** menu sets the function of TurboDLD*Classic* itself. This menu allows for customization of the driver for speed or to adjust for memory constraints.

- **Display List** - Enables or disables the display list feature of TurboDLD*Classic*. This option should always be set to enable, disabling the Display List will cause TurboDLD*Classic* to run as an ordinary non-display list driver.

- **Drawing Cache** - Enables or disables TurboDLD*Classic*'s internal drawing cache, a compressed list of the current viewport, which speeds up pans zooms and redraws. As in the Display List option, **Drawing Cache** should normally be enabled. In low memory situations, it may be desirable to disable the Drawing Cache. Disabling the drawing cache will free-up memory for AutoCAD but may or may not have a visible effect on your ZOOM and PAN performance. For example, on VGAs, the performance benefit of the drawing cache is as little as 5%. With a TIGA-based graphics board, however, the performance benefit of the drawing cache is as high as 400%.

- **AutoCAD Logical Drawing Space** - Using AutoCAD 31-Bit Space, configures TurboDLD*Classic* for use with AutoCAD R12's 31-Bit logical drawing space. When set to Yes, the driver will use AutoCAD's extended 31-Bit drawing space. Selecting No, will use a 15-Bit drawing space, similar to that of AutoCAD R11.

  The 31-Bit logical space allows you to extend your Regen-less zooming ability by a factor of several million, at the cost of more memory. Additional memory is used by AutoCAD for the drawing space, and by TurboDLD*Classic* for the Display List. 31-Bit zooming and panning is about 10%-20% slower than for 15-Bit logical space. The Use AutoCAD 31-Bit Space setting is ignored for AutoCAD R11 installations.

- **Internal Command Echo** - The echo of TurboDLD*Classic* internal commands can be enabled or disabled with the **Internal Command Echo** option. If you would like to see TurboDLD*Classic*'s internal commands display at the AutoCAD command line as they are executed, enable this option.

- **Big Picture Zoom Mode** - Sets the Big Picture (BP) zoom definition area display options. In a zoomed view of the static BP, as the current viewport is zoomed or panned, Float mode causes the image in the BP to move around within the bird's-eye window, keeping the zoomed viewport area fixed in the center of the bird's-eye. Freeze mode will lock the current BP contents into place to provide a better overall frame of reference.

- **Regen Mode** - As a convenience feature, a **Regen Mode** option has been added to TurboDLD*Classic*. A Fast Regen will store the AutoCAD drawing until the Display List has been created, and then display it, all at once. The Incremental mode displays the drawing in 'chunks' as the display list is created. The Fast mode causes Regens to process approximately 5%-10% faster than the incremental. Neither mode changes memory requirements.

After all options have been set, use the arrow keys to scroll down to the **Save and Exit** option and then press the [Enter] key to continue.

Next, configure the AutoCAD screen display characteristics and then type [Y] to accept the changes.

Exit to the AutoCAD drawing editor to begin using TurboDLD*Classic*.. If you are reconfiguring AutoCAD, and currently have a drawing loaded you must exit the drawing, and reload the drawing.

The last step in setting-up TurboDLD*Classic* is to configure the colors for AutoCAD. From the AutoCAD Command Line, type DLDCOLOR[Enter], to start CustomColors, TurboDLD*Classic*'s color configuration utility. Make any desired color changes and then **Save** the new color palette and then **Exit** to return to the drawing editor.

Verifying your TurboDLD*Classic* installation

To verify that TurboDLD*Classic* is running and installed correctly, follow one of these two simple tests.

- If you have the AutoCAD side menu enabled, look for the Panacea Logo in the lower right-hand corner.
- If you are running AutoCAD without a side menu, type DLDVER[Enter] at the AutoCAD command prompt. If TurboDLD*Classic* is loaded and running, this command should return your current version, and serial number.

Reconfiguring TurboDLD*Classic*

To reconfigure TurboDLD*Classic* follow the instructions below for your version of AutoCAD, Release 12 or Release 11.

AutoCAD Release 12, 13

If you need to make changes to your TurboDLD*Classic* configuration, type CONFIG[Enter] at the AutoCAD command prompt or use ACAD -R[Enter] when starting the program. Select option 3, **Configure Video Display**. Answer No[Enter] to the **Select a new videodriver ...** prompt to start the TurboDLD*Classic* configuration program. Make the desired changes to the driver and then **Save and Exit** to continue to the AutoCAD drawing editor.

AutoCAD release 11

To change a Release 11 configuration, select option 5, **Configure AutoCAD** from the AutoCAD main menu, and then from the configuration menu, select option 3, **Configure Video Display**. Answer no to the **Select a new video driver ...** prompt to start the TurboDLD*Classic* configuration program. Change the desired driver options. Save and Exit to return to the AutoCAD configuration menu. Open or begin a new drawing.

To completely reconfigure TurboDLD*Classic* using Panacea's defaults, delete DLDSETUP.DAT from either the \ACAD\DRV sub-directory (R12) or the TURBODLD sub-directory (R11) and then follow the Driver Configuration instructions earlier in this chapter.

Configuring an AutoCAD 11 environment

During the TurboDLD*Classic* installation process, a FASTACAD.BAT file is created and placed into the TURBODLD sub-directory. FASTACAD.BAT contains four lines that set four separate environment variables: DLDCFG - used by TurboDLD*Classic* to find all of its configuration files; and DSPADI, RCPADI, RDPADI - used by AutoCAD, 3D Studio and AutoShade 2 w/RenderMan, respectively, to find the driver file. FASTACAD.BAT must be run prior to starting AutoCAD R11 and only needs to be run once per system boot. For automatic loading of the environment variables, FASTACAD.BAT may be added to the AUTOEXEC.BAT file or an AutoCAD start-up batch file.

To add FASTACAD.BAT to your AUTOEXEC.BAT file, insert the line

  CALL D:\TURBODLD\FASTACAD

anywhere in the file. The above example assumes that FASTACAD.BAT resides in a sub-directory on drive D: called \TURBODLD.

If you do not wish to put FASTACAD in your AUTOEXEC.BAT file, you may put it in a batch file which also starts AutoCAD, or simply remember to run the file before starting AutoCAD.

If you get the message **Out of Environment Space** when you run FASTACAD.BAT, you will need to enlarge your system's environment. This is accomplished by adding the following line,

  SHELL=C:\COMMAND.COM /P /E:768

to your CONFIG.SYS file. The **/E:768** specifies an environment size of 768 bytes. Change this number as appropriate. You will need to reboot after modifying your CONFIG.SYS file, in order for the changes to take effect.

Configuring AutoShade, 3D Studio and AVE Render

AutoShade

To configure AutoShade v2.0 to use TurboDLD*Classic*, first run the FASTACAD.BAT file from your TurboDLD*Classic* sub-directory to set the AutoShade environment variables. Next, start AutoShade with SHADE /R[Enter], which will allow you to reconfigure AutoShade. For the display device, select **P386 Autodesk Device Interface display driver**, and for the rendering display select the **P386 Autodesk Device Interface rendering driver**. If you are running the display and rendering screen on the same monitor (i.e. single monitor), make sure to tell AutoShade this. A single monitor approach will require a redraw of the display screen after a rendering screen.

Next, follow the same installation steps that were used to select the graphics board and display and rendering resolutions for AutoCAD.

3D Studio release 1.X & 2.X

Configuring 3D Studio requires three steps. First, you need to set the environment variables for 3D Studio by running the PANA3DS.BAT file that was copied into your TurboDLD*Classic* sub-directory. Next, edit the 3DS.SET file, located in your 3DS directory. The following three lines may be changed to use the RCPADI rendering driver. Locate the lines that begin with

> **RENDER-DISPLAY**
>
> **MAIN-DISPLAY**
>
> **MATERIAL-DISPLAY**

and change them to read

> **RENDER-DISPLAY=RCPADI**
>
> **MAIN-DISPLAY=RCPADI**
>
> **MATERIAL-DISPLAY=RCPADI**

Make sure to remove the ';' or any spaces that may be present at the beginning of the line.

It is only necessary for the **RENDER-DISPLAY** line to be set to RCPADI in order to render at high resolution. If you do not need a high resolution main display screen or if you will not be using the materials editor, you may keep **MAIN-DISPLAY** and **MATERIAL-DISPLAY** set to their defaults.

For 3D Studio 1.x, there is no **RENDER-DISPLAY** line. The corresponding line is **DEFAULT-DISPLAY** and should be changed to read

> **DEFAULT-DISPLAY="RCPADI"**

The quotes around RCPADI must be used for this version of 3D Studio.

The **MATERIAL-DISPLAY** should only be configured for RCPADI when BOTH the Display AND Rendering Resolutions of TurboDLD*Classic* are configured for 256 color resolutions. An unpredictable Materials Editor screen will appear if anything other than 256 colors is selected. If you are unsure about the function of the Materials Editor screen, use the Materials Editor as VGA, you should not have any problems at all. Please note too, that the use of the Materials Editor will not give you any more colors to choose from.

Save the above changes and start 3D Studio to begin the last part of the configuration procedure.

From your 3D Studio directory, delete the file 3DADI.CFG by typing

```
DEL 3DADI.CFG[Enter]
```

This will cause 3D Studio to start in its reconfiguration mode. Start 3D Studio by typing 3DS[Enter].

During the 3D Studio reconfiguration start-up, you are prompted with a series of questions. After the first 3D Studio question appears and is answered, the TurboDLD*Classic* configuration program will appear. Select a graphics board and display and rendering resolutions as you would for AutoCAD use.

Because RCPADI device drivers, by definition, are combined display and rendering devices, during 3D Studio reconfiguration, you will be brought to the TurboDLD*Classic* configuration menu more than one time, once each for Display and Rendering. It is not necessary to select display and/or rendering resolutions a second time. Simply press the [Enter] key to remove the help screen and then highlight **Save and Exit** to continue to the next question. Also if FASTACAD.BAT is used instead of PANA3DS.BAT to define the AutoCAD operating environment, the TurboDLD*Classic* configuration menu will also appear for RDPADI and DSPADI devices if they are present.

3D Studio v3.X

Panacea's TurboDLD*Classic* drivers will run with 3D Studio release 3.X. Please use 3D Studio's default RCPADI VIBRANT GRAPHIC DRIVER CONFIGURATION. Follow the Vibrant Graphics Configuration Program Setup Procedures that are found in your 3D Studio 3.X Installation Manual for ADI 4.2 Drivers.

From your Turbodld Sub-directory run PANA3DS.BAT to set the 3D Studio environment settings.

Run 3DS VIBCFG.

During Configuration for Vibrant Graphics there will be four categories, Main-Display, Materials-Display, Render-Display, and Flic Playing. For these four categories set **RCPADI**.

When Vibrant Graphic settings are complete click **OK** to exit and save settings. The Setup for Turbodld Classic Drivers will then commence. Follow the menus to Setup Display and Rendering Screen. Save and Exit to 3D Studio.

Please note that the out of the box drivers that are supported in 3D Studio release 3.X are supplied and maintained by Autodesk.

TurboDLD*Classic* only provides still rendering support for 3D Studio. TurboDLD*Classic* will not play back rendered .FLI or .FLC files. This is a limitation of 3D Studio. The Mapping Icon colors, which are usually yellow and green, will appear as black when using any external ADI driver. Also, 3D Studio has problems with large fonts. It is recommended that you use the default font settings.

AVE Render

AutoCAD 12 & 13's AVE Render uses TurboDLD*Classic*'s rendering capabilities to render objects and drawings. If AVE Render has never been configured, when you first select the AutoCAD render command, you will be forced to run through the configuration process. You will be prompted as follows.

1. Select a **Rendering Display Device**. Since TurboDLD*Classic* is a combined display/rendering device, choose item 1, **P386 ADI Combined Display/Rendering Driver** from the available choices.

2. Configure the **Rendering Graphics Board and Resolution**. Here the TurboDLD*Classic* configuration program will appear on the screen. Press the [Enter] key to continue past the help screen and display the **Rendering Configuration** menu. Choose **Select Graphics Board/ Resolution** to display graphics board and resolution menu selections. First, choose **Select Render Graphics Board** to select the graphics board to be used for renderings. Next, choose **Select Render Resolution** to select the desired rendering resolution from the list of available choices. Select **Return to Previous Menu** and then select **Save** and **Exit**.

3. Select **Render Mode**. Then select the rendering mode for TurboDLD*Classic*. Select either **Render to Viewport** or **Render to Screen** depending on how you wish to view your renderings. Note that in order to render to a viewport you must be using a display resolution of at least 256 colors. Otherwise, AVE Render will not allow a render to viewport selection.

4. Select a **Render Hard Copy Device**. If you are using a render hard copy device select your device type from the list of choices. If you are not using a hard copy device, accept the default of **NULL**.

After configuring AVE Render, you will return to the drawing to render the current drawing.

If you have previously configured AVE Render, type RCONFIG[Enter] at the AutoCAD command prompt to manually display the **Render Configuration** menu. Follow these steps to re-configure AVE Render.

1. Select option 2, **Configure Rendering Device** to choose a new rendering driver. Answer [Yes] to the **Select Different Rendering Device** question.

2. Select option 1, **P386 Combined Display/Rendering Driver**.

3. Configure the rendering graphics board and resolution. Here the TurboDLD*Classic* configuration program will appear on the screen. Press the [Enter] key to continue past the help screen and display the **Rendering Configuration** menu. Choose **Select Graphics Board/Resolution** to display graphics board and resolution menu selections. First, choose **Select Render Graphics Board** to select the graphics board to be used for rendering. Next, choose **Select Render Resolution** to select the desired rendering resolution from the list of available choices. Select **Return to Previous Menu** and then **Save** and **Exit**.

4. Select the rendering mode for TurboDLD*Classic*. Select either **Render to Viewport** or **Render to Screen** depending on how you wish to view your renderings. Note that in order to render to a viewport you must be using a Display resolution with at least 256 colors. Otherwise, AVE Render will not allow a render to viewport selection.

5. Select **Exit to the Drawing Editor** from the **Render Configuration** menu and then type [Y] to keep the changes you've just made. Press the [F1] key to change to the graphics screen if necessary.

Changing colors

Included with TurboDLD*Classic* is the CustomColors color configuration utility. What is so unique about CustomColors is that it gives you the ability to modify all of your changeable AutoCAD colors, including menu colors, text colors, dialog box colors, and even drawing colors, while running AutoCAD.

CustomColors simulates an AutoCAD screen, complete with all possible objects. At the AutoCAD drawing editor command line, type DLDCOLOR[Enter] to edit the color configuration. Once you enter the utility, you are provided with the following configuration menu at the bottom of the screen:

(O)bject,

(D)rawing,

(P)hysical,

(A)DI reset,

(V)GA reset,

(L)oad,

(S)ave,

(E)xit

The menu items perform the following functions.

• **Object** - Selecting this option will allow you to change the color of any AutoCAD screen object, such as the graphics area background color, the menu area text color, or the border line color.

Select the object whose color you want to change by moving the highlight box around with the left and right cursor control keys and pressing [Enter] when you have highlighted the desired object. Note that a one line description of the object type is displayed at the top of the screen as you move the box around.

Once you have selected the object, another highlight box will appear around the color boxes nearest to the bottom of the screen. These are the physical colors that the video board supports. Use the left and right cursor keys to select the physical color to be used for the object you have selected and press [Enter]. The screen will quickly redraw with the new color selection for the object you have chosen, and you will be back at the start of object selection in case you want to change the color of another object.

Note that at any time during color configuration, you can press the [Esc] key once or twice and return to AutoCAD. Also, pressing the question mark [?] key will provide you with context sensitive help.

• **Drawing** - This option allows you to modify AutoCAD drawing colors 0, 8 and 9, in a fashion similar to the way you change object colors.

When this option is selected, a highlight square appears in the drawing color area of the simulated AutoCAD display. The square can be manipulated using the four cursor keys. You may notice that the drawing color portion of the display is laid out just like the CHROMA drawing supplied with AutoCAD. When you press [Enter], the highlight moves down to the 16 physical colors, just as it does during the object color selection. Using the arrow keys, pick the physical color you want to represent the selected drawing color. Press [Enter] to have your selection take effect.

• **Physical** - choosing the Physical option from the menu allows you to alter the red, green, and blue components of the physical colors. A highlight box will appear in the row of 16 physical colors at the bottom of the screen.

Use the arrow keys to select the color you wish to edit and press [Enter]. Three sliders will appear near the bottom of the display, with the horizontal position of the slider for each of the color components (red, green, or blue - RGB) indicating the relative intensity of the component. You can use the left and right arrow keys to move the slider for the selected component, or type in a number from 0 to 255.

Many graphics boards do not support 255 different intensities for each color component. Therefore, when you enter an intensity, Custom Colors will round it to the nearest intensity which your graphics board supports. For example, VGAs support 64 intensities per RGB color component. This means intensities increase in multiples of 4 (256/64), therefore an intensity of 0 is the same as an intensity of 3.

The up and down arrows allow you to select which component you want to alter. As you manipulate the sliders, all objects on the display that are of the same color as the selected physical color will change in hue. This way you can visually determine the most appropriate setting for your display. Pressing [Enter] will set the RGB values you have selected for the physical color you were modifying.

- **ADIreset** - constructs a default ADI color palette, as defined in the Autodesk Device Interface Driver Development Kit.
- **VGAreset** - constructs a default VGA color palette in the first 16 color entries. The remaining palette colors remain identical to those used for ADI devices.
- **Load** - reloads the color information from the file DLDCOLOR.DAT. It will be loaded from the directory pointed to by DLDCFG (AutoCAD R11), or from the AutoCAD R12 \DRV directory. If DLDCOLOR.DAT cannot be found, an error message will be displayed.

  This command is useful because it allows you to go back to your previously edited color configuration in case you have made some mistakes in configuring your colors that you want to undo.

Don't Accidentally Wipe Out Your Changes. Selecting **ADIreset**, **VGAreset**, or **Load** will irrevocably wipe out any current color changes you may have made, unless you have just saved your new setting, so use them only when you really need to, such as when you have made so many color changes that you cannot seem to get back to a reasonable place and just want to start over.

- **Save** - Saves the current color palette to DLDCOLOR.DAT. It will be saved to the directory pointed to by the DLDCFG environment variable in FASTACAD, or to the \ACAD\DRV (R12) directory if FASTACAD is not used.
- **Exit** - Exits CustomColors. If you have made palette changes, but not saved them, you will be asked if you want to save your changes before exiting.

When running at more than 8 bits-per-pixel (256 colors), setting physical colors via DLDCOLOR will have no visible effect until a **SAVE** and **EXIT** occurs.

TurboDLD*Classic* commands

TurboDLD*Classic* offers AutoCAD users many features and productivity options. This section alphabetically lists the basic commands found in TurboDLD*Classic* and provides the correct syntax for their usage. For a brief summary of TurboDLD*Classic* commands type DLDHELP at the AutoCAD command prompt.

The most important feature of TurboDLD*Classic* is the addition of a world view called The Big Picture™ or BP for short. Bringing up the BP allows you to view where in the current drawing you are currently located in your active viewport, and it also gives you the ability to dynamically move to another part of the drawing without having to exit the function you are currently executing.

DLDBIGPIC

To call up the Big Picture, at the AutoCAD command line, type DLDBIGPIC[Enter], or double click the right mouse button or button 2 on your digitizer puck. (if you haven't redefined your BP Button double click). This will bring up the BP on the display. You will see cross-hairs and a highlighted section indicating which part of the whole drawing you are currently viewing - the size of the image will be determined by the AutoCAD logical drawing space being used, 15-Bit or 31-Bit. The selection or pick box will have an '**X**' through it. Move the mouse/digitizer around to locate your pick box. If you can't see a small box moving, click the left mouse button (the pick button) to size down the pick area. In size mode, the pick box will have a right pointing arrow in it ('—>'). If the contents of the BP are too small to work with, you may increase the size of the image in the window by pressing the [+] key on your numeric keypad this performs an incremental zoom within the BP. Likewise, pressing the [-] key will reduce the size of the contents of the BP. Pressing the [Home] and [End] keys will put the BP into its smallest and largest size, respectively. The smallest BP size is defined as being exactly the same view as that in the viewport referenced by the BP. The largest BP size is defined as the largest image possible without causing a Regen.

The BP pick box is always proportioned to the proper aspect ratio for the current viewport. Clicking the pick button again will put you back into the pick box move mode ('**X**'). This operation is very similar to using the **Zoom Dynamic** feature of AutoCAD. Once you have positioned the pick box on the area you would like displayed in the active viewport, click any button other than the pick button to initiate the zoom, or press the [Enter] key. If you want to abort the operation, just hold any button down, other than the pick button, until the BP disappears. You can also hit any key on the keyboard, other than [Enter], to cancel the BP. Note that the BP is updated with new drawing commands, but that moves or erases will not update the image unless BPREFRESH is enabled. A DLDREFRESH or a REGEN will manually update the BP with the current drawing changes.

DLDBPCACHE*

Enables or disables TurboDLD*Classic*'s internal cache for BP features. This cache speeds up TurboDLD*Classic*'s Big Picture functions. DLDBPCACHE is normally disabled. Performance benefits of the BP Cache with will vary from one graphics platform to the next. For example, on VGAs, the performance benefit of the BP Cache is as little as 1%.

DLDBPDIM

Resizing and repositioning the BP can be accomplished by typing this command at the AutoCAD prompt. DLDBPDIM allows you to tell the driver where you want the BP placed and how large you want it to be. The size is limited to being between one-quarter and one-half the width of the display. This command functions like the pan/zoom selection box in the BP, as far as positioning and dimensioning goes. To abort, hold the right mouse button, or any other digitizer button, down until the moving box disappears.

DLDBPFREEZE

Sets the Big Picture (BP) zoom definition area display options. DLDBPFREEZE toggles the Big Picture Zoom Mode parameter in TurboDLD*Classic*'s Expert Configuration Menu.

In a zoomed view of the static BP, as the current viewport is zoomed or panned, Float mode causes the image in the BP to move around within the bird's-eye window, keeping the zoomed viewport area fixed in the center of the bird's-eye. Freeze mode will lock the current BP contents into place to provide a better overall frame of reference.

DLDBPHILIGHT*

Changes the highlight used to display the Big Picture among three modes, Patt Line, XOR Rect, and Both. Patt Lines will use dotted lines to outline the Big Picture pick box. XOR Rect will use a contrasting rectangle to highlight the pick box, and Both will use a combination of Patt Lines and XOR Rect.

DLDBPREFRSH*

This convenience feature of TurboDLD*Classic*, toggles the Big Picture update mode. If disabled, the BP is updated manually by issuing a DLDREFRESH command. When enabled, DLDBPREFRSH will cause the BP to refresh automatically when an object is drawn or erased. The BP operations therefore will be slower with DLDBPREFRSH enabled.

DLDBPSTATIC

Toggles the BP to stay on the screen at all times. Use this command if you want the BP on the screen in order to conveniently move into it whenever you want to zoom or pan. Typing DLDBPSTATIC will put up the BP at the position you set with DLDBPDIM. Note that the static BP will disappear when other menus pop-up on the screen, and it will also disappear if you draw any objects which may overwrite the BP. With these exceptions, the BP will remain on-screen until you either exit the drawing screen or you type DLDBPSTATIC again.

DLDCOLOR

Invokes CustomColorsTM, Panacea's color configuration program.

DLDCOMPACT

Forces a manual garbage collect of Display List memory thereby returning unused display list memory back to the AutoCAD memory pool.

DLDDCACHE*

This command toggles the TurboDLD*Classic* drawing cache on and off. The Drawing Cache is a compressed form of the current viewport which speeds pans, zooms and redraws

DLDDLIST*

This command toggles the display list function of TurboDLD*Classic* on and off.

Please note that if the display list is turned off, you will be running AutoCAD as though you were using a standard non display list driver - pans, zooms and redraws will be MUCH slower with DLDDLIST disabled.

DLDECHO*

Toggles internal TurboDLD*Classic* command echoing at the AutoCAD command line. When TurboDLD*Classic* commands are executed via the digitizer or pop-up menus, they generate internal commands which will be displayed at the AutoCAD command line if DLDECHO is enabled. Disable DLDECHO to simplify the command line.

DLDHELP

Provides a list of TurboDLD*Classic* commands with one-line description of each, within AutoCAD. It's recommended that you flip to the text screen by pressing the [F1] key to view the output.

DLDREFRESH

Refreshes the Big Picture to reflect the most current changes to a drawing. If the static BP is up, it will be updated. If not, the next time the BP is brought up, it will contain a current representation of your drawing, provided no changes were made between the DLDREFRESH command and the DLDBIGPIC command. For Automatic update of the Big Picture, see the DLDBPREFRSH command above.

DLDSTAT

Displays the current TurboDLD*Classic* status. A listing of the current TurboDLD*Classic* parameters will be displayed at the AutoCAD command line. A flip to the graphics screen is recommended for this command.

DLDUSAGE

Use DLDUSAGE if you want a to-the-byte breakdown of how memory is being used, specifically for display list processing. DLDUSAGE returns information regarding the memory each viewport is occupying. Since AutoCAD supports multiple viewports, it is possible to have multiple display lists.

DLDVER

Displays the TurboDLD*Classic* version, serial number and registered user's name at the AutoCAD command line.

DLDVISREGEN*

Toggles between the Fast and Visible Regen modes of TurboDLD*Classic*. A Fast Regen will create the display list and then display the drawing all at once. A Visible Regen will display the drawing in chunks as the display list is created. This command is a dynamic form of the Regen Mode parameter in the Expert Configuration Menu. Since TurboDLD*Classic*'s Fast Regen mode is faster than AutoCAD's, we highly recommend its use.

Please note that the commands above with a '*' following them, when issued within AutoCAD, will override the selections made during TurboDLD*Classic* configuration, for the current drawing session only. Exiting AutoCAD and subsequently restarting will cause all feature settings to revert back to those selected in the TurboDLD*Classic* configuration menu. If you wish to make the current changes permanent, reconfigure TurboDLD*Classic*.

Memory usage and lists

TurboDLD*Classic* shares extended memory with AutoCAD via the PharLap Virtual Memory Manager. This means that TurboDLD*Classic* will automatically page to disk if it uses up all the RAM that AutoCAD has left for its use. See the AutoCAD 'Installation and Performance Guide' for more information on Virtual Memory Management.

Please note that if you start seeing excessive hard disk accesses during PANs, REDRAWs, and ZOOMs while using AutoCAD with TurboDLD*Classic*, try using the DLDCOMPACT command. If this does not affect the amount of disk access it is probably time to add more memory to your system. Contact your AutoCAD dealer for assistance in upgrading your memory.

Regarding display list memory, it is important to realize that TurboDLD*Classic* speeds up AutoCAD operations by creating a Display List in memory, and sending that list to the graphics board for pans, zooms and redraws. But a display list takes up memory.

How much memory?

For production use, we recommend that at least 1 megabyte is available for TurboDLD*Classic*. To determine how much memory AutoCAD is using, use the status command while in AutoCAD (refer to the AutoCAD 'Installation and Performance Guide' for more information). The Display List for a simple drawing like the shuttle Columbia might only require 20 Kbytes for the Display List. Complex drawings may require several megabytes. We have seen Display Lists for a drawing range from one-tenth the size of the drawing file to three times the size; in general, the Display List averages about the same as the DWG file size. This means that you should count on the Display List generally taking up as much as twice the DWG file size. Also, complex objects such as circles and text "expand" when translated into display list format, so a drawing with a lot of complex objects and text will have a larger Display List than a simpler drawing.

Keeping the Display List small

Text takes up a disproportionate amount of space in the Display List. To keep the list small, put text in its own layer of the drawing. Then do not display the text layer when editing the rest of the figure. This will keep memory consumption down and speed up PANs, REDRAWs, and ZOOMs.

Read the AutoCAD manuals

The AutoCAD manuals have an excellent section on performance, concentrating on memory usage. To get the most performance out of the program, read the appropriate sections of those manuals as well as this one.

TIPS AND TRICKS

Upgrading from older Panacea DLD drivers

Be sure to remove any reference to previous DLD driver commands (FASTACAD calls or SET parameters) or sub-directories that may be in your AUTOEXEC.BAT file or in AutoCAD start-up batch files. Such references could cause AutoCAD and TurboDLD*Classic* to look in the wrong place for setup information.

If you have been using a previous Panacea DLD driver and wish to use the color palette you customized for it with TurboDLD*Classic*, you may copy the DLDCOLOR.DAT file from your older DLD's sub-directory to the sub-directory you specified during the TurboDLD*Classic* installation process.

Maneuvering Through AutoCAD

Zooming

When zooming into an image, be aware of your AutoCAD grid snap setting. If you are zoomed extremely far into a drawing and you are having trouble moving your digitizer cursor, you may be snapping to a point which is not part of the zoomed viewport. If the cursor only moves to a single point, or is not on screen at all, turn the grid snap off.

TurboDLD*Classic* and Paper Space

TurboDLD*Classic* features do not work in AutoCAD's Paper Space. The execution of any TurboDLD*Classic* command in Paper Space will result in an error message at the command prompt.

Zoom Dynamic

We do not recommended using ANY TurboDLD*Classic* features while in the Zoom Dynamic mode of AutoCAD. Because TurboDLD*Classic* cannot determine when Zoom Dynamic has been initiated, unpredictable results will occur. Use the Big Picture feature of TurboDLD*Classic* to accomplish the same task as Zoom Dynamic, in a much more efficient fashion.

Switching Color Modes

When switching color modes, (i.e. from 16 to 256 or vice versa) the DLDCOLOR command should be run in order to reconfigure your color palette for the number of colors selected. A black cursor and disappearing crosshairs are both symptoms of a color palette problem.

AutoCAD R12's CONFIG command

Configuring TurboDLD*Classic* in the middle of a drawing session using the CONFIG command is a bit like exiting and re-starting AutoCAD. If are using the static Big Picture, you will have to re-initialize it after returning from the **Configuration** menu.

Sticky Cursors

Sometimes, when using the Big Picture, the digitizer cursor will appear to stick to the edge of the bird's-eye. This is normal and is the result of the digitizer puck responding to the whole screen area while the Big Picture only occupies a small portion of the screen. Because of the difference in resolutions between the screen and the digitizer, when the screen cursor enters the Big Picture area, the digitizer puck has more drawing area to cover in order to get to the same location as the screen cursor.

Using AutoCAD Commands

Since TurboDLD*Classic* is totally transparent to users with respect to using normal AutoCAD commands to REDRAW, PAN, and ZOOM, you still have to suffer from some of AutoCAD's nuances. One of these nuances is that ZOOM ALL and ZOOM EXTENTS both force a REGEN, because AutoCAD does not keep track of various boundaries necessary to avoid the REGENs. And REGENs are rather time-consuming and do not use any display list processing to speed themselves up. One way around this problem is to use another of AutoCAD's built-in features, namely the VIEW command.

When you first load your image and see the whole drawing on the screen at once, just type VIEW Save ALL[Enter], which will save the display position you see under a view named 'All'. Then, after you have done some detailed editing and want to return back to the big picture, type VIEW Restore ALL[Enter], instead of ZOOM All[Enter] or ZOOM Extents[Enter], and the full drawing will be restored to the display at display list speeds, without a REGEN.

Another nuance of AutoCAD's is that if you zoom in too far or pan over too far, you may inadvertently cause a REGEN. AutoCAD again provides a very simple solution: the REGENAUTO command. Just type REGENAUTO Off[Enter] at the AutoCAD command prompt, and automatic REGENs will be disabled. The REGENAUTO setting is also saved as part of your drawing file, so you only need to execute it once per drawing. You may even want to set REGENAUTO off in your ACAD.DWG drawing template so that all your drawings are created with REGENAUTO set off.

Third-Party Software

If you are having trouble with TurboDLD*Classic* and third-party AutoCAD applications, be sure that the third-party application supports ADI 4.2. In order to use the ADI 4.2 specification, third-party applications require new T-Drivers and therefore must be revised. If an application does not specifically say that it is ADI 4.2 compatible, it probably is not. Check with the manufacturer to be sure.

If your third-party application is ADI 4.2 compatible and you are having trouble using TurboDLD*Classic*, try running AutoCAD without the third-party application to try to isolate the problem. Also, try the third-party application with the VESA compatible driver shipped with AutoCAD, this will also help to isolate the source of the problem.

Also note that any third-party TSR that needs to access the display may not work properly when using AutoCAD with any advanced ADI display driver, especially if the TSR switches graphics modes. Most TSRs will not support the same graphics platforms as TurboDLD*Classic* and therefore, will not be able to accommodate mode switching back and forth.

Command summary

This section lists the basic commands found in TurboDLD*Classic*. Commands have been listed alphabetically.

DLDBIGPIC	calls up the Big Picture - use digitizer clicks to define an area and zoom into it.
DLDBPCACHE	enables or disables the Drawing Cache for TurboDLD*Classic* advanced features.
DLDBPDIM	allows resizing and repositioning of the Big Picture.
DLDBPFREEZE	toggles the Big Picture Zoom Mode between Float and Fixed modes.
DLDBPHILIGHT	selects the highlight mode used to display the Big Picture.
DLDBPREFRSH	enables and Disables the Big Picture automatic update mode.
DLDBPSTATIC	toggles the Big Picture to stay on the screen at all times.
DLDCOLOR	invokes CustomColorsTM, Panacea's color configuration program.
DLDCOMPACT	forces a manual clean-up of Display List memory returning any unused memory back to the AutoCAD memory pool.
DLDDCACHE	toggles the TurboDLD*Classic* drawing cache on and off.
DLDDLIST	toggles the display list function of TurboDLD*Classic* on and off.
DLDECHO	toggles internal TurboDLD*Classic* command echoing at the AutoCAD command line.
DLDHELP	provides a list of TurboDLD*Classic* commands with one-line description of each, within AutoCAD. It's recommended that you flip to the text screen to view the output.
DLDREFRESH	refreshes the Big Picture to reflect the most current changes to a drawing.
DLDSTAT	displays a listing of the current TurboDLD*Classic* parameters. A flip to the graphics screen is recommended for this command.
DLDUSAGE	gives a to-the-byte breakdown of how memory is being used for display list processing.
DLDVER	displays the TurboDLD*Classic* version, serial number and registered user's name at the AutoCAD command line.
DLDVISREGEN	toggles between the Fast and Visible Regen modes of TurboDLD*Classic*.

Lotus 123 v2.x

To install a Lotus display driver, proceed as follows:

1. Run the installation program (INSTALL.EXE), and choose the option for the Lotus 123 drivers and specify the drive and directory where you want them copied to (such as C:\LOTUS).

2. From within the Lotus sub-directory type:

   INSTALL [Enter]

3. From the next menu, select **Advanced Options** for Lotus 123 v2.2 or **Change Selected Equipment** for Lotus 123 v2.3.

4. For v2.2, select **Add New Drivers to Library** and go to step 3. For v2.3, select **Modify Current Driver Set** and go to step 6.

5. From the next menu, select **Modify Current Driver Set**.

6. From the next menu, select one of the display and resolution configurations.

7. From the next menu, select **Return To Menu**.

8. From the next menu, select **Save Changes**.

9. Enter the name you have selected for the driver set. We recommend that the driver set name reflect or include the driver's resolution (e.g. 132x43) NOTE: The default driver set name assigned by the program is 123.SET.

You may create multiple driver sets with different display resolutions. To run Lotus 1-2-3 with a specific driver set, type:

```
123 SETNAME [Enter]
```

where SETNAME is the name of the desired driver set.

Lotus 123 v3.x

To install a Lotus 3.0 or 3.1 display driver, proceed as follows:

1. It is assumed that Lotus 1-2-3 v3.0 or 3.1 is already installed on your hard disk, using the standard Lotus installation utility. To install this driver, make the directory containing 1-2-3 v3.0 the current directory. For example, if 1-2-3 is in the directory named 123R3, then type the following command:

```
CD \123R3[Enter]
```

2. One of the files used in the driver installation is named INSTALL.DDF. This is a text file used by the 1-2-3 installation utility, containing information on each of the drivers and modes of operation. If you have been using a driver supplied with another graphics adapter, you may want to make a backup copy of the INSTALL.DDF file currently in your 1-2-3 directory.

```
COPY INSTALL.DDF INSTALL.BAK [Enter]
```

3. Run the installation program (INSTALL.EXE), and choose the option for the version of Lotus 123 that you are using and specify the drive and directory where you want them copied to (such as C:\123R3). If the INSTALL.DDF has been copied to a backup file (see step 2 above), answer YES to the prompt to confirm overwriting the file.

4. Now run the Lotus installation utility by typing:

INSTALL[Enter]

5. Select **Change selected equipment** from the list. Note: If you are currently using another driver supplied with a graphics board, it may be necessary to choose First-time installation.

6. Select **Modify Current DCF**, or **Choose Another DCF** to modify, according to your preference. The following procedure is valid for either selection.

7. Select **Change Video Display**. This will present you with a list of all the display types provided with the 1-2-3 distribution, with two additional choices. 100 Column Display (800x600 resolution) supports 100x31, 100x42, and 100x75 16 color modes. 128 Column Display (1024x768 resolution) supports 128x40, 128x54, and 128x96 16 color modes. Select a resolution that best meets your requirements.

8. After your selection is made, choose the **Save Changes** option from the menu. Note that when some high-resolution modes are selected, a message may appear asking for the drive letter of the floppy disk. Before entering the drive letter, insert the disk that is requested in the floppy drive. After inserting the disk, you may enter the drive letter containing that diskette.

OS/2 2.1, 2.11

If you choose not to install the OS/2 version 3.0 driver, use the following instructions. If you wish to install the OS/2 version 3.0 drivers, please refer to the next section: OS/2 2.1, 2.11, 3.0

OS/2 versions 2.1 and 2.11 support 16 color and 256 color resolutions.

You will need the following programs for installation: CLMODE.EXE or Video Adapter Utility program to select monitor type.

IMPORTANT NOTE:

IBM's DISPINST.EXE uses SVGA.EXE to identify the SVGA chipset before proceeding with the installation of a display driver. The IBM SVGA.EXE shipped with OS/2 2.1 does not correctly ID the chipset. Running CLINST21.CMD will update SVGA.EXE with the new SVGA.EXE before calling DSPINSTL.EXE. This will help OS/2 identify the chipset correctly. If you are having trouble installing the Drivers, manually rename the IBM SVGA.EXE to SVGA.IBM and copy the new SVGA.EXE file to your OS/2 subdirectory. During installation, the target file may have a newer date than the source file. Select the **Yes** button when the installation program displays a dialog box to notify the user of this situation. Information about SVGA.EXE can be found in the OS/2 User Manual.

Install from floppy diskette:

1. Insert the OS/2 display driver disk (must have volume labeled "DISP 1") into a floppy drive.
2. Invoke an OS/2 window session or an OS/2 full screen session.
3. Select the floppy drive with the display driver disk, e.g. `a:[Enter]`.
4. Run CLINST21.CMD from the floppy drive, e.g. `clinst21 c[Enter]`.
5. Check the **Primary Display** check box from the **DISPLAY DRIVER INSTALL** dialog box.
6. Select the **Accelerated Driver** from the **PRIMARY DISPLAY ADAPTER TYPE** dialog box.
7. The **MONITOR CONFIGURATION/SELECTION UTILITY** dialog box will appear. Click **OK** for default monitor settings (which is monitor type 3) or select **Display Adapter Utility Program** and run your display adapter utility program to set your monitor type.

For example:

```
c:\vgautils\clmode.exe t640=75   t800=75
t1024=75   t1280=75
```

CLMODE.EXE comes in your Utilities Disk.

8. Select the display resolution of choice from the **SELECT DISPLAY RESOLUTION** list box.
9. Click the **Install** button in the **SOURCE DIRECTORY** dialog box and follow prompts.

Install from the hard drive:

1. Xcopy the display driver disk one to the hard drive, target directory must be named DISP_1, e.g. `xcopy a: c:\disp_1`.
2. Invoke an OS/2 window session or an OS/2 full screen session.
3. Change to \disp_1 directory, run CLINST21.CMD,

    e.g. `clinst21 c[Enter]`.
4. Check the **Primary Display** check box from the **DISPLAY DRIVER INSTALL** dialog box.
5. Select the **Accelerated Driver** from **PRIMARY DISPLAY ADAPTER TYPE** dialog box.
6. The **MONITOR CONFIGURATION/SELECTION UTILITY** dialog box will appear. Click **OK** for default monitor settings (which is monitor type 3) or select **Display Adapter Utility Program** and run your display adapter utility program to set your monitor type.

    For example:

    ```
    c:\utils\clmode.exe m5
    ```
    CLMODE.EXE comes in your Utilities Disk.

7. Select the display resolution of choice from the **SELECT DISPLAY RESOLUTION** list box.
8. Click the **Change** button in the **SOURCE DIRECTORY** dialog box, type

    ```
    c:\disp_1
    ```
    in edit box and follow prompts.

To install Windows 3.1 drivers for OS/2 2.1:

Installation for full screen 256 color drivers for Windows 3.1 for chipsets. Note that you should not use the 65,536 or 16 million color Windows 3.1 drivers with OS/2.

1. Run Full Screen Win-OS/2.
2. If you have not previously installed the Windows 3.1 drivers and utilities, select **File** from drop-down menu.
3. Select **Run**, and then Browse A: or B: drive, wherever your Windows 3.1 Driver Disk resides, and run INSTALL.EXE.
4. In the driver configuration dialog, select OS/2 2.1 in the operating system group. Then select the desired resolution and color.
5. If you had previously installed Windows drivers, you must run the WinMode utility and select OS/2 2.1 in the operating group.

If you are installing Win-OS/2 and had previously installed the Windows drivers, you must run WinMode and select OS/2 2.1 in the operating system group before installing Windows.

6. To use Power Management Screen Saver

    Go to **Control Panel**
    Select **Desktop**
    Select **Screen** Saver
    Select **Display Power Management**
    Select **SETUP** to setup the Power Management Screen Saver

Note: It is recommended that the resolution you choose corresponds with the resolution you are running in OS/2. When installing new OS/2 PM Drivers the standard Win-OS/2 Driver will be installed for Full Screen Windows 3.1. You must use the WinMode Utility to install the Full Screen accelerated driver. Seamless support will still use the standard OS/2 Driver.

OS/2 2.1, 2.11, 3.0

The following is the procedure to upgrade OS/2 2.X to support OS/2 3.0 drivers. You may also use these drivers to upgrade your OS/2 3.0 drivers.

OS/2 version 2.X and 3.0 supports 16 color, 256 color, 64K color, and 16 million color resolutions.

You will need the following programs for installation: CLMODE.EXE or Video Adapter Utility program to select monitor type.

Install from floppy diskette:

1. Insert the OS/2 display driver disk (must have volume labeled "CIRRUS 1") into a floppy drive.
2. Invoke an OS/2 window session or an OS/2 full screen session.
3. Select the floppy drive with the display driver disk, e.g. `a:[Enter].`
4. Run SETUP.CMD from the floppy drive, e.g. `SETUP a: c:[Enter].`

This will upgrade your OS/2 to allow you to use the drivers. When setup is finished it will instruct you to reboot and run the Display Driver Install in your System Setup folder. Reinsert your driver disk.

5. Check the **Primary Display** check box from the **DISPLAY DRIVER INSTALL** dialog box.
6. Select the **Accelerated Driver** from the "IBM BBS" from the **PRIMARY DISPLAY ADAPTER TYPE** dialog box.
7. The **MONITOR CONFIGURATION/SELECTION UTILITY** dialog box will appear. Click **OK** for default monitor settings (which is monitor type 3) or select **Display Adapter Utility Program** and run your display adapter utility program to set your monitor type.

For example:

```
c:\vgautils\clmode.exe t640=75  t800=75
t1024=75  t1280=75
```

CLMODE.EXE comes in your Utilities Disk.

8. Select the display resolution of choice from the **SELECT DISPLAY RESOLUTION** list box.
9. Click the **Install** button in the **SOURCE DIRECTORY** dialog box and follow prompts.

After the installation is complete, open the **System Icon** in the **System Setup**, located in the **OS/2 System Folder**.

On Page 1 of the **System Settings: Screen**, you will see the screen resolution and screen refresh rates.

On Page 2 of the **System Settings: Screen**, you will see the **Change Display Configuration: Display Name** which describes the current display monitor, and the **View Current Configuration** button. Select a monitor from the **Display Name** list. Go to Page 2 and click on the **View Current Configuration** button to display the **Configuration** screen which will display the maximum resolutions and refresh rates supported by the monitor you have selected. Select the desired resolution and the highest refresh rate for your selected monitor. This will be translated to the Screen Refresh Rate on page 1. Select the 75 Hz Refresh Rate, for example, and shutdown and reboot OS/2. The new resolutions and refresh rates you selected for your monitor will now be updated and supported by the OS/2 display driver.

Win 3.X drivers for OS/2 2.X - 3.0

The new OS/2 drivers will install Win-OS/2 drivers. No special installation is required.

Problems running SVGA.EXE in DOS

If you encounter problems using SVGA.EXE in Windowed DOS or Full Screen DOS, follow the procedures below:

1. Have a DOS Boot Disk available and boot with the DOS operating system in drive A:.

If you are running an older BIOS prior to v1.30 and you need to run the new BIOS TSR, load the TSR at this time.

```
ex:  VGAPIX.EXE
```

2. Run CLMODE.EXE to set monitor type.

```
ex:  c:\vgautils\clmode.exe t640=75  t800=75
     t1024=75  t1280=75
```

3. Insert the OS/2 Installation Disk in Drive A:.

4.   Run SVGA.EXE.

ex: SVGA ON DOS

This will create an SVGADATA.DOS file on your diskette.

5.   Copy this file to your OS/2 subdirectory in your hard drive.

ex: copy a:\SVGADATA.DOS c:\os2\SVGADATA.PMI

6.   Remove disk from drive A: and reboot OS/2 operating system.

Anytime SVGA.EXE will not run in DOS W INDOWED or DOS FULL SCREEN, repeat this procedure.

Microsoft Word

The high resolution Microsoft Word 5.0 display driver supplied with your SB486PV VGA supports both high resolution text and graphics. When using a Microsoft Mouse with the driver, please ensure that your mouse driver version level is 7.0 or above.

 The TSRFONT.EXE utility must be loaded prior to running an application requiring an 8x14 font. Please refer to the Utility software section for more information.

Installing Word display drivers

To install the Word high resolution text driver supplied with your SB486PV VGA, follow these instructions:

1.   If you have not already done so, install Microsoft Word onto your computer system. Follow the instructions supplied with Word. When asked for a screen display type, choose IBM Video Graphics Array (VGA).
2.   Run the installation program (INSTALL.EXE), and choose the option for the Microsoft Word drivers and specify the drive and directory where you want them copied to (such as C:\WORD5).

To use the new drivers they must be installed in the same directory as Word. Otherwise, they must be copied to the Word directory before they can be used.

3.   INSTALL.EXE will copy two screen drivers:

•   SCREEN8.VID - for 800x600 graphics resolution
•   SCREEN.VID - for 1024 x768 graphics resolution

The driver to be used must be named SCREEN.VID. When a file is renamed this, it will overwrite the existing display driver. If you wish to preserve the original, it should be renamed or copied prior to installation of the new drivers.

4. The new driver is now installed, and to use it, run Word as you normally would. To view and change the screen resolutions, select **Options**, move the cursor to display mode, and press [F1]. Choose the desired screen resolution from the list presented.

5. A sub-menu will appear, listing all the choices of resolutions supported by the text driver. Select the desired resolution.

WordPerfect 5.1, 6.0

WordPerfect 6.0

To use high resolution modes with WordPerfect 6.0, install the VESA driver that comes with WordPerfect and configure the program to use one of the VESA high resolution graphics modes.

The TSRFONT.EXE utility must be loaded prior to running an application requiring an 8x14 font. Please refer to the Utility software section for more information.

WordPerfect 5.1

The high resolution WordPerfect version 5.1 driver supplied with your SB486PV VGA supports both high resolution text and graphics. WordPerfect allows graphics and text drivers to be set up separately, so be sure to install both of these drivers.

The TSRFONT.EXE utility must be loaded prior to running an application requiring an 8x14 font. Please refer to the Utility software section for more information.

Installing WordPerfect 5.1 display drivers

To install the WordPerfect high resolution text driver supplied with your SB486PV VGA, follow these instructions:

1. If you have not already done so, install WordPerfect onto your computer system. Follow the instructions supplied with WordPerfect.

2. Run the installation program (INSTALL.EXE), and choose the option for the WordPerfect drivers and specify the drive and directory where you want them copied to (such as C:\WP51).

3. Start WordPerfect, and go into **SETUP** by typing [Shift-F1].

4. Choose Display [2], then text screen type by pressing [3].

5. Move the cursor to where 543X appears on the list, and choose **SELECT**.

6. A sub-menu will appear, listing all the choices of resolutions supported by the text driver. Select the desired resolution.

To install the WordPerfect high resolution graphics driver supplied with your SB486PV VGA, follow these instructions:

1. If you have not already done so, install WordPerfect onto your computer system. Follow the instructions supplied with WordPerfect.

2. Run the installation program (INSTALL.EXE), and choose the option for the WordPerfect drivers and specify the drive and directory where you want them copied to (such as C:\WP51).

3. Start WordPerfect, and go into **SETUP** by typing [Shift-F1].

4. Choose Display [2], then graphics screen type by pressing [2].

5. Move the cursor to where SB486PV VGA appears on the list, and choose **SELECT**.

6. A sub-menu will appear, listing all the choices of resolutions supported by the graphics driver. Select the desired resolution.

WordStar

The WordStar display drivers support WordStar versions 5.5, 6.0 and above.

Installing WordStar drivers

To install the WordStar high resolution text driver supplied with your SB486PV VGA, follow these instructions:

1. If you have not already done so, install WordStar onto your computer system. Follow the instructions supplied with WordStar.

2. Run the installation program (INSTALL.EXE), and choose the option for the WordStar drivers and specify the drive and directory where you want them copied to (such as C:\WS).

3. Using a text editor enter the file FONTID.CTL in the WordStar directory and change the CRT_TYPE line to read:

```
CRT_TYPE=CL800.WGD
```

When WordStar is executed, the display driver will be used for page preview mode.

Declaration of Conformity

(according to ISO/IEC Guide 22 and EN 45014)

ICS
A D V E N T ™

6260 Sequence Drive
San Diego, CA 92121-4371
800 523-2320

declares that the product:

SB4862PV/66	SB4862PV5/66	SB4862PVN/66	SB4864PV/100
SB4864PV5/100	SB4864PVN/100	SB486PV/33	SB486PV5/33
SB486PVN/33	SB486XPV/33	SB486XPV5/33	SB486XPVN/33

to which this declaration relates, meets the essential health and safety requirements and is in conformity with the relevant EU Directives listed below:

EU EMC Directive 89/336/EEC
EU Low Voltage Directive 73/23/EEC

using the relevant section of the following EU standards and other normative documents:

EN 50081-1:1992 Emissions, Generic Requirements.
 -EN 55022 Measurement of radio interference characteristics of information technology equipment.

EN 50082-1:1992 Immunity, Generic Requirements.
 -IEC 1000-4-2:1995 Immunity for radiated electromagnetic fields.
 (Supersedes IEC 801-2)
 -IEC 1000-4-3:1995 Immunity for radiated RF electromagnetic fields.
 (Supersedes IEC 801-3)
 -IEC 1000-4-4:1995 Immunity for AC and I/O lines, fast transients common mode.
 (Supersedes IEC 801-4)

EN 60950:1992   Safety of Information Technology Equipment.

Mr. Jim Jameson   July 30, 1999
President & Chief Executive Officer   San Diego, CA

Information supporting this declaration is contained in the applicable Technical Construction file available from:

ICS
E U R O P E ™

Ben Turner Industrial Estate
Oving Road
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PO19 4ET, UK

Customer Comments

If you experience any problems with this manual or just want to give us some feedback, please review the form below. Please detail any errors you find and send the information to us via our Web site. We will correct the errors/problems as soon possible and put the latest version up on our Web site. Once the manual is updated, you may download a .pdf copy from our technical support library at:
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At our Web site you will find an online form that will ask the following types of questions.

Your Name: _____

Company Name: _____

Customer Number: _____

E-mail address: _____

Phone: (_____) _____

Product: **SB486PV Series**

Manual Revision: **00431-013-7C**

On the web site there will also be a place where you can enter your error information, comments, concerns about our products, and/or request technical support.