INDUSTRIAL COMPUTER SOURCE®

SB586T Series
Product Manual

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INDUSTRIAL COMPUTER SOURCE®

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FOREWARD

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

Technical assistance is available at: **1-800-480-0044**.

Manual Errors, Omissions and Bugs: A "Bug Sheet" is included as the last page of this manual. Please use the "Bug Sheet" if you experience any problems with the manual that requires correction.

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.

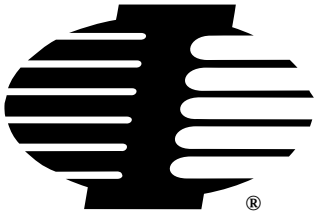
Limited Warranty

One year limited warranty on all products sold 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 one year of purchase, Industrial Computer Source will repair or replace, at our option, any defective product. At any time after one year, 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. Industrial Computer Source will service the warranty for all standard catalog products for the first year from the date of shipment. After the first year, for products not manufactured by Industrial Computer Source, 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. Industrial Computer Source will normally return your replacement or repaired item via UPS Blue. *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 Industrial Computer Source or its authorized agent; or if the failure is caused by accident, acts of God, or other causes beyond the control of Industrial Computer Source 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. Industrial Computer Source reserves the right to make changes or improvements in any product without incurring any obligation to similarly alter products previously purchased.



Shipments not in compliance with this Guarantee and Limited Warranty Return Policy will not be accepted by Industrial Computer Source.

Return Procedure

For any Limited Warranty or Guarantee return, please contact Industrial Computer Source's Customer Service at **1-800-480-0044** and obtain a Return Material Authorization (RMA) Number. All product(s) returned to Industrial Computer Source 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 Industrial Computer Source shipping container. If the original container has been lost or damaged, new shipping containers may be obtained from Industrial Computer Source Customer Service at a nominal cost.

Limitation of Liability

In no event shall Industrial Computer Source 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. Industrial Computer Source 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 Industrial Computer Source 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. ***Industrial Computer Source 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 information which may provide special instruction or extra information which may help to simplify the use of the product.

CAUTION!

A Caution is used to alert you of 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 excalmation 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, Industrial Computer Source 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 insure proper precautions and procedures are followed.

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Current Revision 3C

October 1997

Chapter 1: Introduction

General

The SB586T series CPU board is a full featured, industrialized, single board computer supporting the Intel Pentium processor. It combines many of the features normally needed for system operation (high speed serial ports, parallel port, disk controllers) on one board. This reduces the number of slots required on the passive backplane, allowing room for additional feature cards. All of the onboard controllers may be totally disabled through the system BIOS.

The CPU board uses the Peripheral Component Interconnect (PCI) bus to communicate with the onboard features. The external bus architecture complies with the Industrial Standard Architecture (ISA) with a PCI bus extension. The PCI bus extension supports the DEC PCI to PCI bridge chip, allowing additional peripherals on the PCI bus.

The SB586T Series supports a full range of Pentium processors with speeds ranging from 100MHz to 233MHz, including Pentium processors with MMX Technology. The processor is installed in a Zero Insertion Force (ZIF) 'Socket 7', and includes a fan-cooled heat sink.

The board has four SIMM sockets, arranged in two banks, and will accept up to 256MB of RAM using 32-bit EDO or 36-bit Fast Page Mode (FPM) SIMMs. A 512k onboard synchronous pipeline burst cache is standard on all models.

On-Board Controllers

Onboard controllers are incorporated into the design of the SB586T Series for disk drives, serial and parallel ports. SCSI and video controllers are options at the time of purchase. All onboard controllers are individually enabled or disabled with the system BIOS.

Display Controller

The SB586TV and SB586TSV (with SCSI) contain a SVGA controller which offers 1MB of DRAM. The SVGA controller offers resolutions of up to 1024 x 768, non-interlaced, with 256 colors. The display portion includes a VESA feature connector, allowing other peripherals to share signals and control of the VGA circuitry. A video Display Drivers and Utilities set is included with the board, and offers programs for display enhancements. These drivers support most operating systems. Please refer to page 1-6, the Supported Operating Systems specification, for a complete list. Please refer to Appendix B for further information on the video drivers. A video controller is not included on the SB586T or SB586TS. Please refer to **Table 1-1** for a list of refresh rates for each video resolution.

Resolution	Refresh Rates Supported
640 x 480	60, 72, 75, 85
800 x 600	56, 60, 72, 75, 85
1024 x 768	60, 70, 72, 75, 85, and 87 interlaced

Table 1-1: Video Resolutions and Refresh Rates

Ultra Wide SCSI Controller

The SCSI controller is a single-ended SCSI-3 Ultra Wide controller, and is based on the 7880 Adaptec AIC. The bus width is autoselectable as 8 bit or 16 bit to maintain maximum compatibility. With the 16 bit bus width selected (Ultra Wide SCSI), throughputs of up to 40MB/sec are possible.

Connection to the SCSI controller is provided through a Single-Ended, 68 pin "P" connector. A high density 68 pin SCSI cable allows full use of 16 bit wide bus transfers. A 68 pin to 50 pin adapter is available to channel the SCSI bus signals to the standard 8 bit, 50 pin connection for older SCSI peripherals.

Normal SCSI and SCSI Wide devices may be used on the same SCSI bus via an optional adapter. If this is done, it is recommended to **have a terminated SCSI Wide Device at the end of the cable** to insure proper termination of all SCSI signals.

Please see the SCSI Connection section in Chapter 2 for further information.

Dual EIDE Disk Drive Controller

Two drive interfaces are provided for EIDE fixed disk drives at J1 and J8. The two EIDE connectors are located on the PCI local bus and support two drives each. The interface includes LBA and PIO mode 4 support, allowing up to 16.6MB/sec throughput speeds.

Floppy Disk Drive Controller

The connector for the floppy disk drive controller is J3, and it will support up to two drives. The floppy drives may range in density from 360K to 2.88MB.

I/O Ports

Two serial ports compatible with the 16550 UART are available on the SB586T CPU. One serial port is extended through a 10 pin header on the board to a bracket mounted DB-9 connector. Also included is an Enhanced parallel port, capable of Bi-directional communication. The parallel port is also extended through a 26pin header on the board to a bracket mounted DB-25 connector. These serial ports are isolated for protection of up to 1500V on signal lines.

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 on board MACH 211 Programable Logic Device. This timer is enabled by setting the DIP switch number three, and writing a "1" to I/O address 351h, data bit "0". When enabled, software will need to toggle bit "0" at I/O address 350h once every 650msec to prevent the timer from timing out and resetting the CPU. The watch dog circuit will also reset the CPU if the +5VDC power input falls below 4.75VDC.

How to remain CE Compliant

In order for computer systems to remain CE compliant, only CE compliant parts may be used. To keep a chassis compliant it must contain only compliant cards, and for cards to remain compliant they must be used in compliant chassis. Any modifications made to the equipment may affect the CE compliance standards and should not be done unless approved in writing by Industrial Computer Source.

The SB586T is designed to be CE Compliant when used in an CE compliant chassis. Maintaining CE Compliance also requires proper cabling techniques. The user is advised to follow proper cabling techniques from external devices to the interface to ensure a complete CE Compliant system. Industrial Computer Source does not offer engineering services for designing cabling systems. Although Industrial Computer Source offers accessories, it is the user's responsibility to ensure they are installed with proper shielding to maintain CE Compliance.

FCC Compliance Statement for FCC Class B Devices

This device complies with part 15 of the 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.

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 when the equipment is operated in a commercial environment. This equipment generates, uses, and radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his or her own expense.

Changes or modifications not expressly approved by the party responsible for compliance could void the user’s authority to operate the equipment.

Note: The assembler of a personal computer system may be required to test the system and/or make necessary modifications if a system is found to cause harmful interference or to be non-compliant with the appropriate standards for its intended use.

Specifications

Processors Supported

Intel Pentium in a ZIF (Zero Insertion Force) 'Socket 7' supporting MMX Technology

Processor Clock Rate

100MHz, 133MHz, 166MHz, 200MHz, or 233MHz

Chip Set

Triton II (Intel 430HX)

BIOS

Hi-Flex Pentium AMIBIOS, Flash EPROM Support

ISA Bus Clock Rate

8.33MHz, 24mA line drivers

PCI Bus Clock Rate

33MHz

Crystal Clock Rate

14.031818MHz ±100ppm

Memory Capacity

256MB Maximum On-board

SIMM Support

2 Banks, 2 Sockets each, 72-Pin, 32-bit EDO or 36-bit FPM (with parity) SIMMs.
ECC Memory Supported

Memory Speed Required

60ns or 70ns

Video Controller - SB586TV and SB586TSV

SVGA Video, Cirrus Logic CL-GD5446
1MB Fast Page Mode (FPM) DRAM installed
VESA Feature Connector
Driver Support under supported operating systems
Rear Panel DB-9, High Density, 15 pin connector, female

Cache Memory

16kB Internal Pentium Chip Cache (32kB on MMX)
512kB Sychronous Pipeline Burst L2 Cache On Board

EIDE Disk Controller

2 Fixed Disk Drives Supported on the PCI Local Bus
Secondary Controller Support
LBA and PIO Mode 4 Support

SCSI Disk Controller

SCSI-2 Ultra Wide controller, Located on PCI Local Bus
8-bit or 16-bit bus, Auto-sensed
To 40MB/sec Throughput
Adaptec AIC-7880 Single-Chip Host Adapter

Floppy Controller

2 Floppy Drives, up to 2.88MB Supported

Serial Ports

2, RS232, 16550 Compatible, FIFO Buffer
Isolated to ±1500V ESD
MAX211E Component incorporated for enhanced ESD protection

Parallel Port

1, Centronics Compatible, Bi-directional Compatibility
EPP and ECP Enhanced Port Modes

Keyboard, Speaker, & Reset Port

Single 8 pin Header Connector for System Interface

Note: The keyboard may be selected as *absent* or *present* by the system BIOS. This will allow the system to boot without a keyboard attached.

Watchdog Timer

Reset CPU automatically if CPU stops operating
Reset CPU automatically if +5VDC varies more than 5%

CMOS Battery

On-board, Included

Supported Operating Systems

Windows NT™ V3.1 and later
Windows '95™
SCO Unix™ V5.0 and later
SCO UnixWare™ V2.1 and later
Solaris™ V2.5.1 and later, using the IDE disk drive controller
MS-DOS™
Windows 3.11™
OS/2™ V2.0 and later

Operating Environment

Temperature: 0°C to 70°C
Humidity: 5% to 95% RHNC

Storage Environment

Temperature: -40°C to 70°C
Humidity: 5% to 95% RHNC

MTBF

>90,000 P.O.H. @ 25°C

Power Requirements

1.6A @ +5V
<100mA @ +12V

Note: The onboard +3.3 is regulated down from the +5V source.

Agency Approvals

FCC Conformity with:
47CFR Part 15, Subpart B
CE Conformity with:
EU EMC Directive 89/336/EEC
EU Low Voltage Directive 72/23/EEC

CE

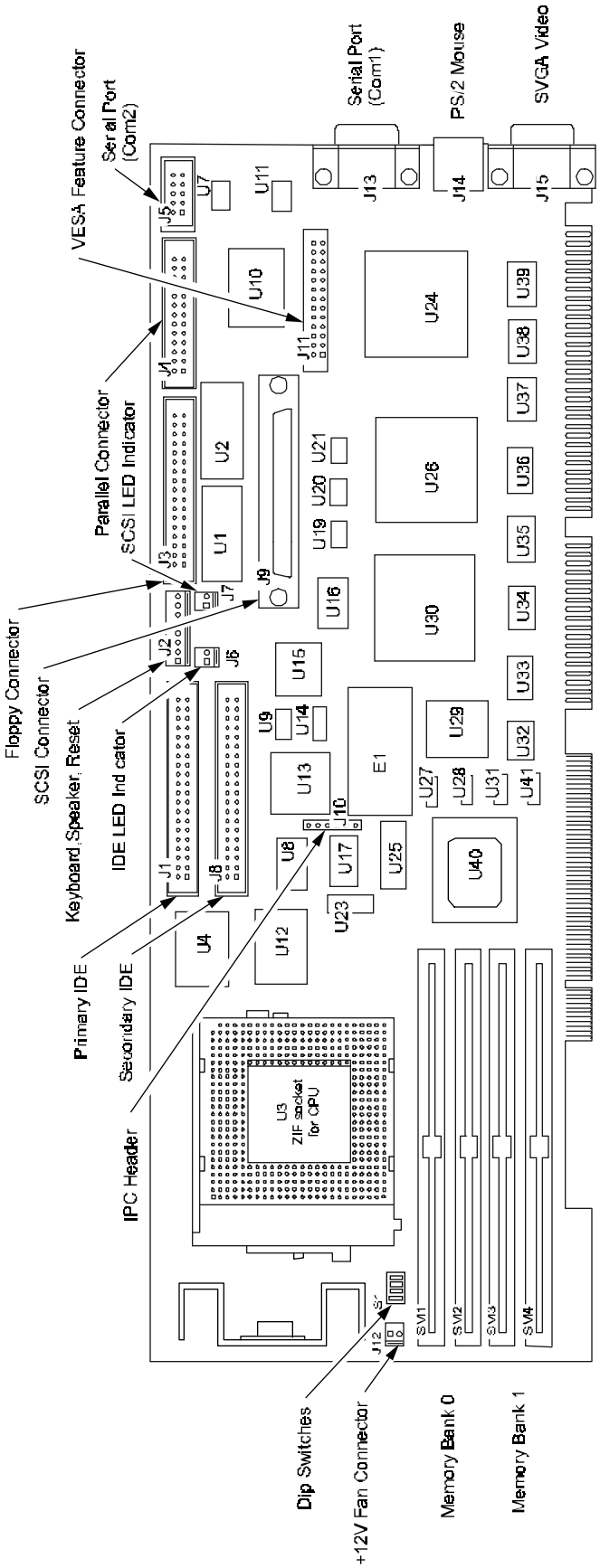

Figure 1-1: Board Layout

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Chapter 2: Installation

If you have purchased your SB586T Single Board Computer with a chassis, the board and its associated components will have been installed and tested for you prior to shipment. If you have purchased your board separately or purchased the board as an add-on, this chapter will cover the steps necessary to add the board to your existing system.

Installation of the SB586T may involve installing board components (such as the memory), configuring the system (setting DIP switches for component compatibility or to enable functions), connecting the Input/Output devices, and setting-up the Operating System. Depending on your system you may need to only do part of this process, but all of the parts of the computer are interdependent, so it is suggested that you check related topics for compatibility. For example: If you are upgrading your processor from 133 to 200MHz, you must change the DIP switch settings for the faster processor speed.

Integrating the Board Components

Integrating the board components is physically adding or removing a component. These components may need to be configured for the system, and/or connected to some Input/Output (I/O) device. The board components that are user changeable are the CPU, the CPU fan, and the Random Access Memory (RAM). Just follow the instructions that follow to install or change that component.

Installing the CPU

The SB586T Single Board Computer supports 100 to 233MHz Pentium CPUs and Pentium MMX Technology. The SB586T is delivered with a CPU and a heat-sink fan assembly. If you are installing a new CPU, it is recommended that a heat-sink fan assembly be used. Installing the CPU onto the SB586T board is very simple:

1. Raise the lever arm of the Zero Insertion Force (ZIF) socket to a vertical position.
2. Align the CPU with the ZIF socket. Note that pin in the upper right corner of the socket (see Board Layout Drawing, **Figure 1-1**), has no insertion hole. Be sure that the corner of the CPU that lacks that pin is aligned with that corner. Note that when properly aligned, the 'cut' corner of the CPU will align with the corner of the ZIF socket next to the end of the lever.
3. Place the CPU in the socket (when properly positioned the CPU will literally drop into place).
4. Lower the ZIF socket lever to its original position, and lock the CPU into place.
5. Make sure that the appropriate DIP switches are set . See page 2-6, DIP Switch Configuration, for more information.
6. Connect the fan to the power connector at J12. For more information on this connector, please see page 3-7.

Installing the Memory

The SB586T Series allows the installation of up to 256MB of Random Access Memory (RAM). The four 72-pin RAM Single Inline pin Memory Module (SIMM) sockets will accept 32 and 36-bit SIMM modules in pairs. See **Figure 2-2** for the location of the memory sockets on the board.

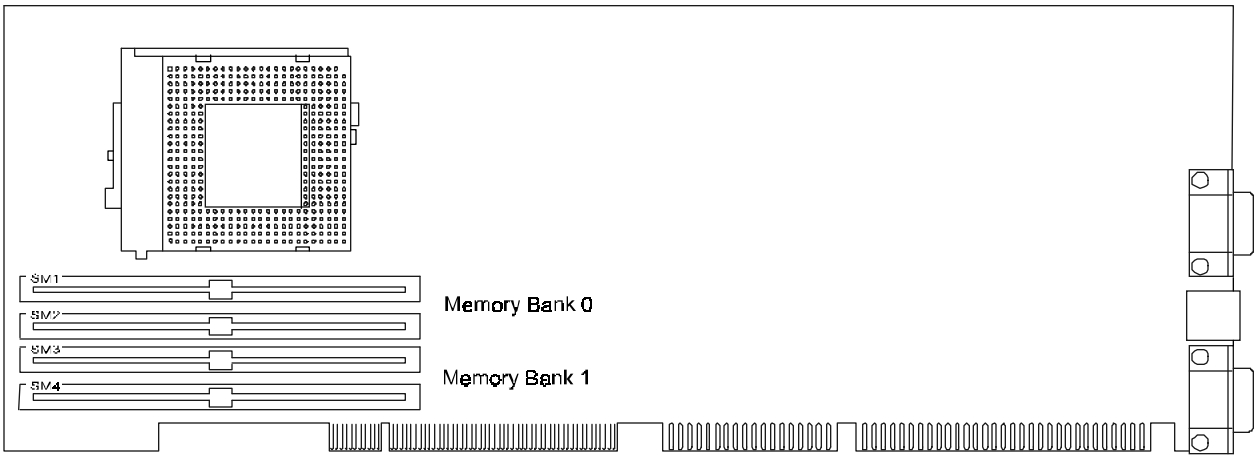

Figure 2-2: Memory Socket Locations

Installing the Random Access Memory (RAM)

The SB586T uses only tinned lead SIMMs. It is recommended that 60ns or 70ns SIMMs be used to ensure reliable operation at 0 wait states. Memory SIMMs must be the same size in both sockets of a bank, and must be installed as a pair. We recommend using only the same manufacture and speed SIMMs on the CPU board.

Note: If DRAM is used, it can be Fast Page Mode (FPM) or EDO RAM with or without parity. While EDO SIMMs are supported, FPM SIMMs with parity or ECC SIMMs are recommended for critical applications.

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.** To install the RAM follow these instructions:

1. Ensure proper static precautions have been taken ***before*** starting any work.

2. Orient the SIMM so that the notched corner of the SIMM is closest to the processor. This notch will fit over a post in this end of the socket. This post allows the SIMM to only be installed in the socket in the correct orientation (See **Figure 2-3**).

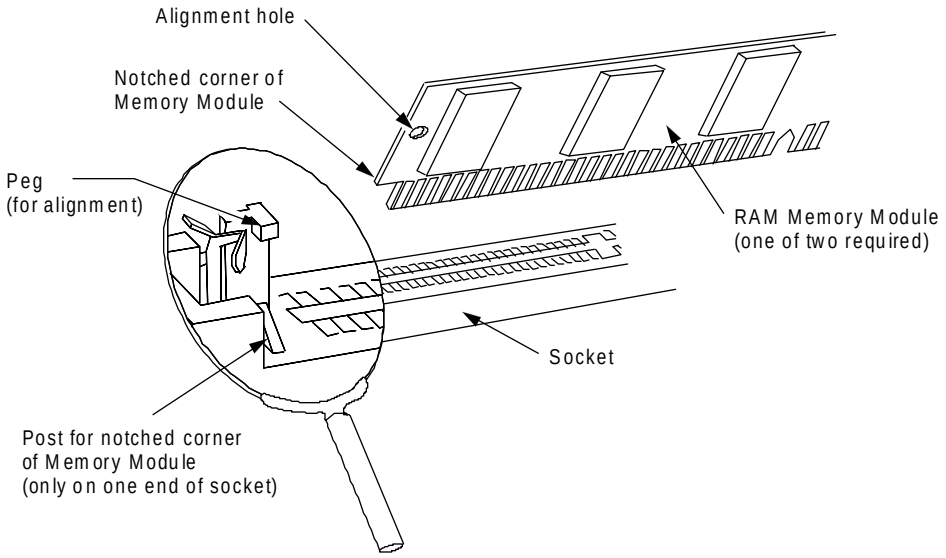

Figure 2-3: RAM Orientation

3. Insert the SIMM into the socket at a 45 degree angle (approximately). Make sure the SIMM is completely seated in the socket (See **Figure 2-4**).

4. Using both hands and applying equal pressure on each end of the module, push the module straight forward until it “clicks”. This will lock the SIMM into position. The pegs of the socket should be in the alignment holes of the SIMM.

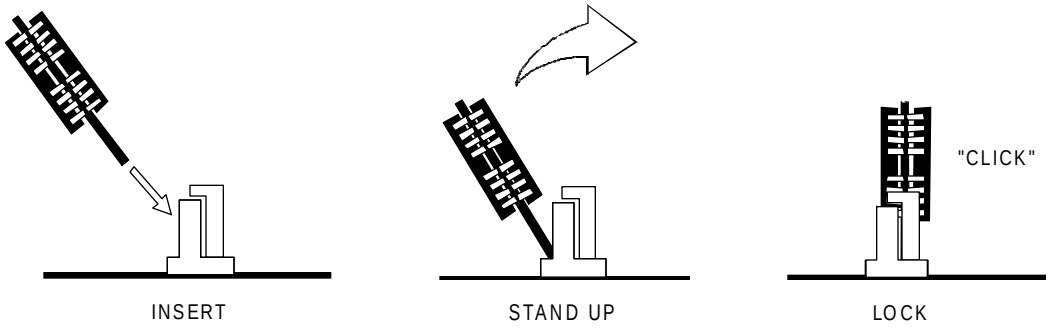

Figure 2-4: SIMM Installation

EIDE and Floppy Device Connection

There are on board controllers for IDE and Floppy drives. The Primary EIDE connector is J1, and the secondary EIDE connector is J8. They both support LBA mode, and each will connect up to two devices. The Floppy connector is J3, and will also connect up to two devices. The connectors are keyed, so that the cables will only connect in a correct orientation. For an illustration of the location of these connectors, please see **Figure 3-1**.

SCSI Device Connection

The SB586T uses an on-board Adaptec AIC-7880 Small Computer System Interface (SCSI) I/O Processor to support Ultra Wide SCSI data transfer rates of up to 40MB. This SCSI processor interfaces the PCI bus to a Ultra Wide SCSI bus.

The SCSI controller will support up to 7 narrow or 15 wide SCSI devices. These SCSI devices may be connected in three different configurations: 8 bit bus, 16 bit bus, or a combination of the two. Using the full 68-pin cable allows the use of the 16 bit bus and will support 16 bit devices. If any SCSI 16 bit devices are used, a 68-pin cable is required. If 8 bit devices are to be installed as well as 16 bit devices, an adapter must be used.

A 68-pin to 50-pin male to male adapter, part number 50313-01, is available to allow for a straight 8 bit SCSI bus chain or a 68-pin to 50-pin female to female adapter, part number 50314-01, for a 8 bit SCSI device to be placed on a 16 bit SCSI Wide bus. Either adapter may be purchased from Industrial Computer Source.

CAUTION!

Use of other SCSI adapters to connect SCSI peripherals to the CPU board could cause damage to equipment or its components. Industrial Computer Source has done extensive testing and approved only the adapters listed in this manual.

In 16 bit SCSI Wide chains, the 68-pin cable is connected with the CPU board at one end and with SCSI Wide devices anywhere on the cable. Adding an 8 bit SCSI device to this chain is accomplished by placing the appropriate adapter on the cable connector and connecting the narrow SCSI device to the adapter (**Figure 2-5**). The necessary signals for the 8 bit device are channeled through the adapter to the SCSI device. The additional 16 bit signals are not carried through the adapter and are sent on down the SCSI chain. Because of this, it is necessary to place a 16 bit device with termination resistors at the end of the chain to insure proper termination of all SCSI signals.

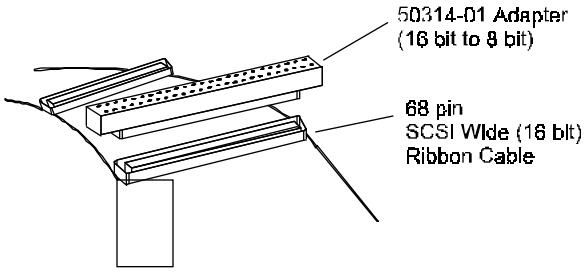

Figure 2-5: 68 to 50-pin Adapter

If a straight 8 bit SCSI chain is desired, the 68-pin to 50-pin male to male adapter is placed on the 68-pin connector on the CPU board. From there, you may run a standard 50-pin ribbon cable to connect the 8 bit SCSI devices as needed (**Figure 2-6**).

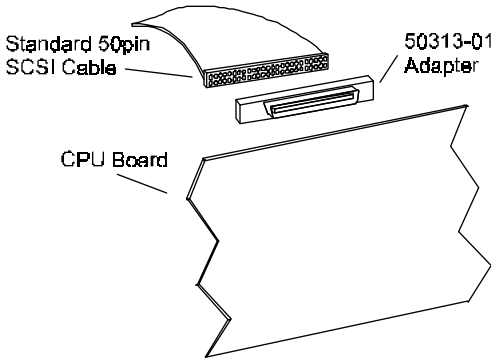

Figure 2-6 Straight 8 bit SCSI Chain

The SCSI controller is assigned SCSI ID 7. It is not permanently terminated and therefore may appear anywhere on the SCSI cable. Any SCSI device at an end of the cable must be terminated using termination resistors to insure the integrity of the SCSI signals. If the controller is at an end of the cable, you must terminate the device using the SCSI Utility software. For more information please see the SCSI Device Driver section on page 2-6.

If your system does not already have a device driver for the new SCSI device you will need to install a device driver. These instructions are provided in the following section.

SCSI Device Drivers

The SB586TS and SB586TSV both have an on-board SCSI controller. This controller comes with supporting SCSI Utility Software that allows such things as controller termination. Please refer to the software documentation for more information. Most Operating Systems will automatically recognize SCSI devices properly installed in the SCSI port. This allows the installation of the operating system from a SCSI-type CD ROM. Once the operating system has been installed, follow the instructions with the device for the proper installation of any required drivers.

If your system is not recognizing the SCSI CD ROM, carefully check for ID conflicts and proper device termination.

DIP Switch Configuration

A DIP switch is provided on the SB586T to clear CMOS (and thereby the password), set the bus speed for the CPU, and enable the on-board Watch Dog Timer. It is located just above the RAM memory sockets. For an illustration of the location of the DIP switch on the board, please refer to **Figure 1-1**.

When the SB586T is installed in your system the switch settings should be checked. Switch 4 should be set for Normal Operation, Switch 3 should be set for 8- or 16-bit SCSI, and Switches 1 and 2 should be set appropriately for the processor being used. Please refer to **Figure 2-7** for the pin settings.

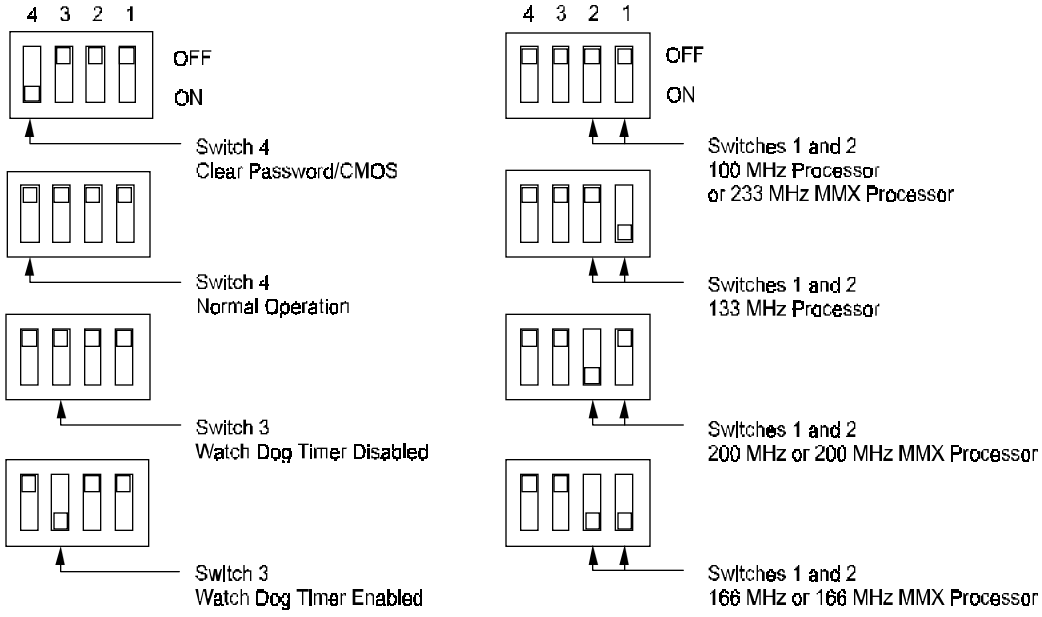

Figure 2-7: DIP Switch Settings

Chapter 3: Connectors

The SB586T has three rear panel and twelve on-board connectors. All on-board connectors have "pin 1" identified by a square pad on the PCB to prevent improper connection of system harnesses. All connectors are also silkscreened with their connector number. All pins supplying power to an external connection are fused for protection. For the locations of the connectors, see **Figure 3-1**.

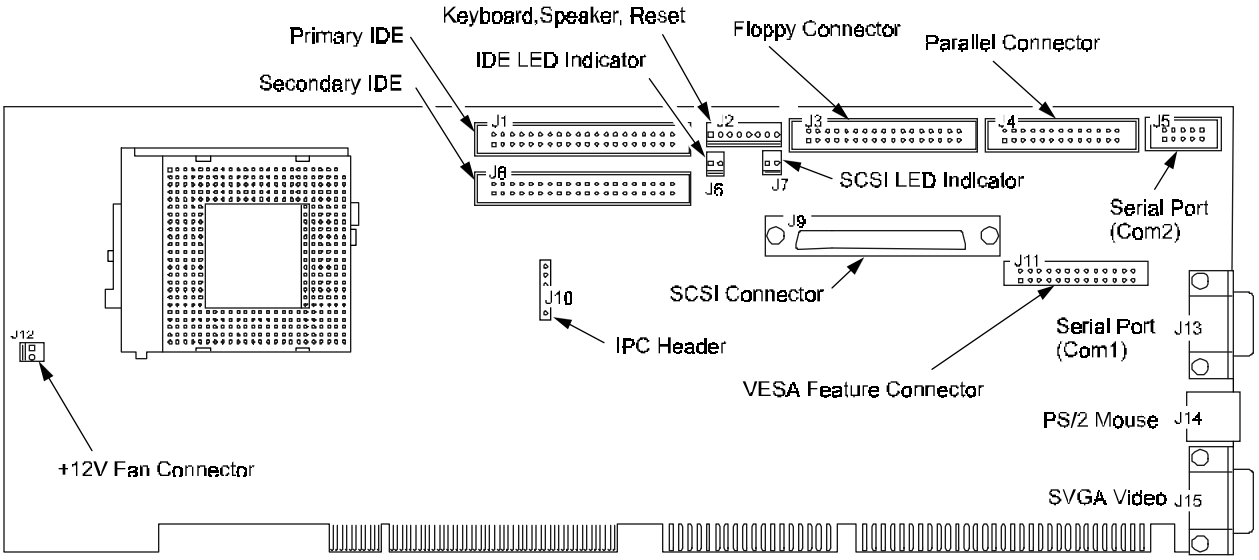

Figure 3-1: Connector Locations

J1: Primary EIDE Hard Drive Port - 40 pin dual row header, AMP 103308-8

This connector supplies the signals from an on-board EIDE controller to interface up to two EIDE hard drives.

PIN	SIGNAL	PIN	SIGNAL
1	Reset	2	Ground
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	Ground	20	No Connection (Key)
21	DMA Request	22	Ground
23	LOC IOW	24	Ground
25	LOC IOR	26	Ground
27	IORDY	28	BALE
29	DMA Acknowledge	30	Ground
31	IRQ 14	32	LOC IOCS16
33	Add 1	34	No Connection
35	Add 0	36	Add 2
37	CS 0	38	CS 1
39	LED	40	Ground

J2: Speaker, Keyboard, Keylock, and Reset - 8 pin single row header, Molex 22-23-2081

The J2 connector supplies speaker, keyboard, and system reset signals. If you purchased the SB486T with a chassis, this will be connected to the chassis speaker, keyboard connector, and reset switch. For more details see the chassis wiring diagram in the chassis users manual.

PIN	SIGNAL
1	Reset
2	Ground
3	Not Connected
4	Keyboard Clock
5	Keyboard Data
6	Keyboard Lock
7	Fused +5VDC
8	Speaker

J3: Floppy Drive Connector - 34 pin dual row header, AMP 103308-7

This connector supplies the signal from an on-board floppy drive controller for up to two floppy drives.

PIN	SIGNAL	PIN	SIGNAL (*)
1	Ground	2	DRVEN0
3	Ground	4	Not Used
5	Ground	6	DRVEN1
7	Ground	8	Index#
9	Ground	10	FDME0#
11	Ground	12	FDSel 1#
13	Ground	14	FDSel 0#
15	Ground	16	FDME1#
17	Ground	18	Dir#
19	Ground	20	Step#
21	Ground	22	WRData#
23	Ground	24	WRGate#
25	Ground	26	TRK 0#
27	Ground	28	WRProtect#
29	Ground	30	RDData#
31	Ground	32	HDSEL#
33	Ground	34	DSKCHG#

(*) the "#" after a signal indicates an active low signal.

J4: Parallel Port Connector - 26 pin dual row header, AMP 103308-6

This allows the connection of parallel devices. Typically, this is the printer connector. Your SB586T will be delivered with this port already connected to a slot filler bracket, for easier access.

PIN	SIGNAL	PIN	SIGNAL (*)
1	Strobe#	2	Auto Feed#
3	Data Bit 0	4	Fault#
5	Data Bit 1	6	Init#
7	Data Bit 2	8	Slct In#
9	Data Bit 3	10	Ground
11	Data Bit 4	12	Ground
13	Data Bit 5	14	Ground
15	Data Bit 6	16	Ground
17	Data Bit 7	18	Ground
19	ACK#	20	Ground
21	Busy	22	Ground
23	PError	24	Ground
25	Select	26	No Connection

(*) the "#" after a signal indicates an active low signal.

J5: Com2 - 10 pin dual row header, AMP 103308-1

This is the second system serial port. It allows the use of serial devices, or serial communications. Your SB586T will be delivered with this port already connected to a slot filler bracket, for easier access.

PIN	SIGNAL	PIN	SIGNAL
1	Carrier Detect	2	Data Set Ready
3	Receive Data	4	Request to Send
5	Transmit Data	6	Clear to Send
7	Data Terminal RDY	8	Ring Indicator
9	Signal Ground	10	No Connection

J6: IDE Hard Drive LED Connector - 2 pin header, Molex 22-23-2021

This connector provides the IDE hard drive access signal. It provides a 5 volt differential to activate any IDE hard drive access LED used in the chassis.

PIN	SIGNAL
1	LED -
2	LED +

J7: SCSI Hard Drive LED Connector - 2 pin header, Molex 22-23-2021

This connector provides the SCSI hard drive access signal. It provides a 5 volt differential to activate any SCSI hard drive access LED used in the chassis.

PIN	SIGNAL
1	LED -
2	LED +

J8: Secondary EIDE Hard Drive Port - 40 pin dual row header, AMP 103308-8

This connector supplies the signals from an on-board EIDE controller to interface up to two EIDE hard drives.

PIN	SIGNAL	PIN	SIGNAL
1	Reset	2	Ground
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	Ground	20	No Connection (Key)
21	DMA Req	22	Ground
23	LOC IOW	24	Ground
25	LOC IOR	26	Ground
27	IORDY	28	BALE
29	DMA ACK	30	Ground
31	IRQ 14	32	LOC IOCS16
33	Add 1	34	No Connection
35	Add 0	36	Add 2
37	CS 0	38	CS 1
39	LED	40	Ground

J9: SCSI-3 Port - 68 pin AMP, 749069-7

The SB586TS and SB586TSV boards have an on-board Adaptec AIC-7880 SCSI processor that will support up to 7 narrow or 15 wide SCSI devices. The controller will automatically sense if it is supporting narrow or wide devices.

PIN	SIGNAL	PIN	SIGNAL (*)
1	Ground	2	Ground
3	Ground	4	Ground
5	Ground	6	Ground
7	Ground	8	Ground
9	Ground	10	Ground
11	Ground	12	Ground
13	Ground	14	Ground
15	Ground	16	Ground
17	Trmpwr	18	Trmpwr
19	No Connection	20	Ground
21	Ground	22	Ground
23	Ground	24	Ground
25	Ground	26	Ground
27	Ground	28	Ground
29	Ground	30	Ground
31	Ground	32	Ground
33	Ground	34	SCSIW#
35	Data12#	36	Data13#
37	Data14#	38	Data15#
39	SCDPH#	40	SCD0#
41	SCD1#	42	SCD2#
43	SCD3#	44	SCD4#
45	SCD5#	46	SCD6#
47	SCD7#	48	SCDPL#
49	Ground	50	Ground
51	Trmpwr	52	Trmpwr
53	N/C	54	Ground
55	SCATN#	56	Ground
57	SCBSY#	58	SCACK#
59	SCRST#	60	SCMSG#
61	SCSEL#	62	SCC/D#
63	SCREQ#	64	SCI/O#
65	SCD8#	66	SCD9#
67	SCD10#	68	SCD11#

(*) the "#" after a signal indicates active low.

J10: ISP Header - 6 pin single row header, AMP 103327-6

This is used for field upgrades to the MACH211-SP Programmable Logic Device, which has In System Programming (ISP) capabilities.

PIN	SIGNAL
1	TDI
2	TCK
3	TMS
4	TDO
5	VCC
6	Ground

J11: VESA Feature Connector - 26 pin dual row header, AMP 1-103328-3

PIN	SIGNAL	PIN	SIGNAL (*)
1	Gnd	2	Pixel data 0
3	Gnd	4	Pixel data 1
5	Gnd	6	Pixel data 2
7	EVIDEO#	8	Pixel data 3
9	ESYNCH#	10	Pixel data 4
11	EDCLK#	12	Pixel data 5
13	DDCCLK	14	Pixel data 6
15	Gnd	16	Pixel data 7
17	Gnd	18	Pixel clock
19	Gnd	20	Blanking
21	Gnd	22	Horiz. Sync
23	n/c	24	Vertical sync
25	DDCDAT	26	Gnd

(*) the "#" after a signal indicates an active low signal.

J12: Fan Power Connector - 2 pin single row friction lock, Molex 22-23-2021

The SB486T is delivered with a fan appropriate for the microprocessor. This fan is powered through the J12 connector with +12VDC.

PIN	SIGNAL
1	+12V
2	Ground

J13: Com1 - DB9 connector, AMP 869436-2

This is the first system serial port. Typically it provides connection for a serial mouse, or for serial communications.

PIN	SIGNAL	PIN	SIGNAL
1	Carrier Detect	2	Receive Data
3	Transmit Data	4	Data Terminal Ready
5	Signal Ground	6	Data Set Ready
7	Request to Send	8	Clear to Send
9	Ring Indicator		

J14: P/S-2 Connector - 6 pin mini DIN, AMP 749231-1

This connector supplies the connection for a P/S-2 type mouse.

PIN	SIGNAL
1	Mouse Data
2	No Connection
3	Ground
4	+5V
5	Mouse Clock

J15: SVGA - 15 pin high density D, AMP 748390-5

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

Chapter 4: Maintenance and Troubleshooting

Your single board computer should provide many years of trouble free service. However, should a failure occur, the following troubleshooting guide should provide some assistance. A generalized repair guide covering all possible computer problems is beyond the scope of this manual. Only problems directly related to the SB586T board will be covered. If you would like assistance with these procedures, please call Customer Service at **1-800-480-0044**. We will be happy to help.

Troubleshooting

The components of a computer are all interrelated. That is, a "video" problem may be caused by the disk controller. The simplest diagnostic technique involves replacing the suspect card with a new one. If that doesn't fix the problem, remove all cards except for the minimum required by the system. Then run the system, replacing each card until the problem shows itself.

FCC Compliance Statement for FCC Class B Devices

This device complies with part 15 of the 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.

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 a 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 or relocate the receiving antenna.
- Increase the separation between the equipment and the 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.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Note: The assembler of a personal computer system may be required to test the system and/or make necessary modifications if a system is found to cause harmful interference or to be non-compliant with the appropriate standards for its intended use.

CAUTION!

The following procedures involve working with high voltage. Contact with this voltage can seriously injure you. Accidental shorting of the circuits can damage the computer.

CAUTION!

The following procedure involves working with a device that is sensitive to static electricity. Electro-Static Discharge (ESD) precautions must be taken. Only qualified personnel should attempt this procedure.

CPU does not boot, there is no beep, and there is no video.

A) Ensure that the CPU is fully seated in the CPU socket, and is correctly oriented to pin 1.

B) With power off, clear CMOS by setting the DIP switch as discussed on page 2-6.

C) Contact our BBS or Website and download the latest Bios flash file. Please refer to Appendix A for Bios upgrade instructions.

At boot, system reports 'No SCSI Boot Device Found'.

A) This message will appear if there is no hard drive on the SCSI bus. Disable the SCSI controller in CMOS setup if no SCSI devices are being used.

B) If a SCSI hard drive is installed, make sure that all cables and power connectors are attached to the SCSI peripherals.

C) Ensure that proper SCSI termination is observed: Only the last physical SCSI device on the bus should be terminated. (Please refer to page 2-4 for more information on termination.)

Hard Disk Drive Controller failure on bootup.

A) If you are using an IDE hard drive to boot, ensure that the power connector and the ribbon cable are properly connected.

B) Check that the drive is configured properly as Master or Slave by jumpers on the drive.

C) Check that the HDD parameters are set up correctly in the CMOS Setup. (You can use auto-detect hard disk to auto-detect correct HDD parameters.)

On boot, the SCSI Bios Banner does not show.

A) Either the on-board SCSI is not enabled in CMOS, or no interrupts are allocated to PCI devices in the CMOS Chipset Setup. At least one IRQ must be allocated for each PCI device on the bus.

Non Plug-and-Play ISA card is not functioning properly.

A) If this card uses an IRQ, make sure that the particular IRQ is reserved to the 'ISA' bus in Chipset Setup in CMOS.

CPU reports No ROM BASIC on bootup.

A) The system cannot find a proper bootable sector on either drive A: or C:. You need to install an operating system on the hard drive, or insert a bootable diskette in the A: drive.

System gives 8 beeps on bootup.

A) This signifies that there is a video adapter problem. Try the video card in a different slot.

B) Try a different video card.

C) If the CPU has on-board video, the on-board PCI Video needs to be Disabled in Chipset Setup in CMOS *before* installing an external video card.

D) If the problem persists, clear CMOS and re-flash the Bios as discussed on page A-4 in the Product Manual. NOTE: If your SB586T has on-board video, and you are using a seperate video card, clearing CMOS will change the On Board PCI Video option in the Chipset Setup in CMOS to Enabled.

Two beeps on bootup showing parity error.

A) Two beeps signify a Parity Error. Re-seat the memory Simm's into the Simm sockets and reboot.

B) If the problem persists, swap Simm's from one memory bank to the other. If the problem goes away after swap, then swap the memory back to the original installation and see if the original error occurs.

C) If the problem still persists after swap, install spare memory modules in CPU.

D) If the problem still persists after installing new memory, then the CPU board may have faulty Simm sockets and will have to be returned for repair.

The system runs very slow.

A) The system will run significantly slower if the cache memory has been disabled in Advanced Setup in CMOS. (Cache memory is automatically disabled when the Fail-Safe option is chosen in CMOS Setup.)

B) Check that the DIP switch settings are correct for the CPU speed (see page 2-6).

Returns

If you need to return a product to Industrial Computer Source for any reason, the following applies:

A) Call Customer Service for an Return Authorization (RA) number. The RA number must be visible on the outside of the box you pack the product into for return shipment. Shipments without an RA number will not be accepted by Customer Service Receiving.

B) Properly pack the product: Put the computer in a bag to prevent moisture and dirt from entering the drive and card areas.

C) Provide adequate packaging and use standard Electro Static Discharge (ESD) precautions. If possible, use the original box and packing the system arrived in. A minimum of 4 inches of proper packing material is required around all sides of computer systems. Double thick cardboard is preferred. **Do not use styrofoam peanuts or loose fill to pack.** Assume the box will be dropped several feet during shipping.

D) Do not ship by motor freight. Use a carrier such as Burlington, Airborne, or Federal Express.

Appendix A: AMIBIOS 95

For the Intel 82430HX Triton II ISA Chipset

For PCI PnP ISA Systems

With Flash ROM Support *User's Guide*

Based on the Enhanced 7/15/95 Core AMIBIOS (Version 6.27).

TritonIIISA715
3/3/96

American Megatrends, Inc.
6145-F Northbelt Parkway
Norcross, GA 30071

Limited Warranty

Buyer agrees if this product proves to be defective, that American Megatrends, Inc. is only obligated to replace or refund the purchase price of this product at American Megatrend's discretion. American Megatrends shall not be liable in tort or contract for any loss or damage, direct, incidental or consequential. Please see the Warranty Registration Card shipped with this product for full warranty details.

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Revision History

3/3/96	Initial release for AMIBIOS 95 (Enhanced 7/15/95 Core AMIBIOS and 7/15/95 Core AMIBIOS).

Preface

Technical Support

If an AMIBIOS or AMIBIOS fails to operate as described or you need more information, call technical support at 770-246-8645. Make sure you have the following information before calling:

- Serial number and revision number of the BIOS
- System BIOS reference number
- A clear description of the problem.

Acknowledgments

This manual was written and edited by Paul Narushoff. The writer gratefully acknowledges the assistance of the BIOS engineers.

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Table of Contents

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Chapter 1: Introduction

This manual documents the AMIBIOS for the Intel 82430HX Triton II PCI Chipset based on the AMIBIOS 95 Core AMIBIOS. This AMIBIOS is designed for a Pentium-based ISA computer system. This AMIBIOS also supports IDE on the PCI local bus.

Plug and Play Support

This AMIBIOS supports the Plug and Play Version 1.0A specification.

PCI Bus Support

This AMIBIOS also supports the Intel PCI (Peripheral Component Interconnect) local bus specification. Please see the Intel technical documentation for additional information.

SRAM Cache Memory Support

This AMIBIOS supports asynchronous and burst SRAM. This AMIBIOS automatically detects the cache memory type and size.

DRAM Support

EDO (Extended Data Out), FPM (Fast Page Mode), and ECC (Error Correction Code) DRAM memory is supported.

Flash ROM Support

Flash ROM support is also included in this AMIBIOS.

The Intel 28F001BXT flash EEPROM is supported. To reprogram the flash ROM, make an update BIOS ROM file and name the file AMIBOOT.ROM. Copy this file to a floppy. The end user can insert the floppy drive in drive A: and press <Ctrl> <Home> while powering on.

PCI SCSI BIOS Support

The Adaptec 7880 PCI SCSI support is included in the system BIOS for the onboard SCSI PCI controller. This AMIBIOS gains control if a Adaptec 7880 SCSI device is detected.

System BIOS

The BIOS is the basic input output system used in all IBM® PC-, XT™-, AT®-, and PS/2®-compatible computers. The AMIBIOS is a high-quality example of a system BIOS.

Configuration Data

AT-Compatible systems, also called ISA (Industry Standard Architecture) must have a place to store system information when the computer is turned off. The original IBM AT had 64 bytes of nonvolatile memory storage in CMOS RAM. All AT-Compatible systems have at least 64 bytes of CMOS RAM, which is usually part of the Real Time Clock. Many systems have 128 bytes of CMOS RAM.

How Data Is Configured

AMIBIOS provides a Setup utility in ROM that is accessed by pressing <Del> at the appropriate time during system boot. Setup configures data in CMOS RAM.

The AMIBIOS Setup utility included in the AMIBIOS for the Intel Triton II ISA Chipset can also be executed via a hot key.

Types of AMIBIOS Setup

Types of Setup	Description
Standard Setup	Sets time, date, hard disk type, types of floppy drives, monitor type, and if keyboard is installed.
Advanced Setup	Sets Typematic Rate, Memory Test, Hit <Del> Message Display, Boot Up Sequence, and many others.
Chipset Setup	Sets chipset-specific options and features.
PCI/PnP Setup	Sets options related to the PCI bus and Plug and Play features.
Peripheral Setup	Controls I/O Controller-related options.
Power Management Setup	Controls power conservation options.

Chapter 2: Standard CMOS Setup

The Setup options described in this section are displayed by choosing Standard CMOS Setup icon from the AMIBIOS HIFLEX Setup Utility main menu. All Standard Setup options are described in this section.

Default Settings

Every option in AMIBIOS Setup contains two default values: an Fail-Safe default and the Optimal default value.

Optimal Defaults

The Optimal default values provide optimum performance settings for all devices and system features.

Fail-Safe Defaults

The Fail-Safe default settings consist of the safest set of parameters. Use them if the system is behaving erratically. They should always work but do not provide optimal system performance characteristics.

Date/Time

Select the Date/Time option to change the date or time. The current date and time are displayed. Enter new values with the PageUp and PageDown keys.

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 entries to configure the hard disk drive named in the option. When you select an entry, 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 **A-5.**. If the drive parameters of your MFM drive do not match any drive type listed on page **A-5**, 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 must select *User* in the **Type** field. You must then enter the drive parameters on the screen that appears. The drive parameters include:

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 (Pri Master, Pri Slave, Sec Master, or Sec Slave). Choose the **Type** parameter and select Auto.

AMIBIOS automatically detects the IDE drive parameters and displays them. Click on the OK button to accept these parameters.

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

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

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

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.

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.						

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Chapter 3: Advanced CMOS Setup

The AMIBIOS Setup options described in this section are displayed by choosing Advanced CMOS Setup from the AMIBIOS HIFLEX Setup Utility main menu. All Advanced Setup options are described in this section.

Quick Boot

Set this option to *Enabled* to permit AMIBIOS to boot within 5 seconds. This option replaces the old **Above 1 MB Memory Test** option. The Optimal default setting is *Enabled.* The Fail-Safe default setting is *Disabled.*

Setting	Description
Disabled	AMIBIOS tests all system memory. AMIBIOS wait up to 40 seconds for a READY signal from the IDE drive. AMIBIOS waits up to .5 seconds after sending a RESET signal to the IDE drive to permit the IDE drive to send a READY signal. AMIBIOS checks if the <Del> key was pressed. Setup is executed if <Del> was pressed.
Enabled	AMIBIOS does not test any system memory above 1 MB. AMIBIOS does not wait for a READY signal from the IDE drive. If a READY signal is not received immediately, AMIBIOS does not configure the drive. AMIBIOS does not wait .5 seconds after sending a RESET signal to the IDE drive. AMIBIOS does not check if the <Del> key was pressed.

Boot Up Num Lock

When this option is set to *On,* AMIBIOS turns off the *Num Lock* key when the system is powered on so the end user can use the arrow keys on both the numeric keypad and the keyboard. The settings are *On* or *Off.* The optimal default and fail-safe default settings are *On.*

1st Boot Device

This option sets the sequence of boot drives for the first boot device that AMIBIOS attempts to boot from after POST completes. The settings are DISABLED, IDE-0, IDE-1, IDE-2, IDE-3, FLOPPY, FLOPTICAL, SCSI, CD-ROM, or NETWORK. The optimal and fail-safe default settings are IDE-0.

2nd Boot Device

The 2nd Boot Device settings are DISABLED, IDE-0, FLOPPY, FLOPTICAL, OR CDROM. The optimal and fail-safe default settings are FLOPPY.

3rd Boot Device

These options set the sequence of boot drives for boot devices. The settings are DISABLED, IDE-0, FLOPPY, FLOPTICAL, OR CDROM. The optimal and fail-safe default settings are CD-ROM.

PS/2 Mouse Support

When this option is set to *Enabled,* AMIBIOS supports a PS/2-type mouse. The settings are *Enabled* or *Disabled.* The Optimal and Fail-Safe default settings are *Enabled.*

Primary Display

This option configures the primary display subsystem in the computer. The settings are *Mono (monochrome), 40CGA, 80CGA,* or *VGA/EGA.* The Optimal and Fail-Safe default settings are *VGA/EGA.*

Password Check

This option specifies the type of AMIBIOS password protection that is implemented. The Optimal and Fail-Safe default settings are *Setup.* The settings are:

Setting	Description
Setup	The password prompt appears only when an end user attempts to run WINBIOS Setup.
Always	A password prompt appears every time the computer is powered on or rebooted.

The AMIBIOS password does not have to be enabled. The end user sets the password by choosing the Password icon on the Setup screen.

Boot to OS/2

Set this option to *Yes* to permit AMIBIOS to run properly if OS/2 or any other operating system that does not support Plug and Play is to be run on this computer. The settings are *Yes* or *No.* The Optimal and fail-safe default settings are *No.*

Internal Cache

This option selects the type of caching algorithm used by AMIBIOS and the CPU for L1 cache memory (internal to the CPU). The settings are:

Setting	Description
Writeback	A write-back algorithm is used.
Write-through	A write-through algorithm is used.
Disabled	AMIBIOS does not specify the type of caching algorithm. The algorithm is set by the CPU.

The Optimal default setting is *Writeback.* The Fail-Safe default setting is *Writeback.*

External Cache

This option selects the type of caching algorithm used by AMIBIOS and the CPU for L2 secondary (external) cache memory. The settings are:

Setting	Description
Writeback	A write-back algorithm is used.
Write-through	A write-through algorithm is used.
Disabled	AMIBIOS does not specify the type of caching algorithm.

The Optimal default setting is *Writeback.* The Fail-Safe default setting is *Disabled.*

System BIOS Cacheable

AMIBIOS always copies the system BIOS from ROM to RAM for faster execution. Set this option to *Enabled* to permit the contents of the F0000h RAM memory segment to be written to and read from cache memory. 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

These options specify how the contents of the video ROM are handled. The settings are:

Setting	Description
Disabled	The Video ROM is not copied to RAM.
Cached	The contents of the video ROM area from C0000h - C7FFFh are not only copied from ROM to RAM, the contents of the C0000h - C7FFFh RAM area can be written to or read from cache memory.
Shadow	The contents of the video ROM area from C0000h - C7FFFh are copied (shadowed) from ROM to RAM for faster execution.

The Optimal default setting is *Cached.* The Fail-Safe default setting is *Disabled.*

C800,16K Shadow

CC00,16K Shadow

D000,16K Shadow

D400,16K Shadow

D800,16K Shadow

DC00,16K Shadow

These options specify how the contents of the adaptor ROM named in the option title are handled. The ROM area that is not used by ISA adapter cards will be allocated to PCI adapter cards. The settings are:

Setting	Description
Disabled	The specified ROM is not copied to RAM.
Cache	The contents of the ROM area are not only copied from ROM to RAM for faster execution, the contents of the RAM area can be written to or read from cache memory.
Shadow	The contents of the ROM area are copied from ROM to RAM for faster execution.

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

Chapter 4: Advanced Chipset Setup

Choose Advanced Chipset Setup from the AMIBIOS HIFLEX Utility Setup main menu. All Chipset Setup options are then displayed and are described in this chapter.

Global Triton2 Enable

Set this option to *Enabled* to enable the Triton II chipset. The settings are *Enabled* or *Disabled*. The Optimal and Fail-Safe default settings are *Enabled*.

Memory Hole

This option allows the end user to specify the location of a memory hole. The settings are *Disabled*, *512-640K*, or *15-16M* (from 15 MB to 16 MB). The Optimal and Fail-Safe default settings are *Disabled*.

IRQ12/M Mouse Function

This option should be set according to the mouse hardware implementation. The Optimal and Fail-Safe default settings are *Enabled*. The settings are:

Settings	Description
Disabled	Choose this setting if the hardware uses IRQ12 for the PS/2 mouse.
Enabled	Choose this setting if a keyboard controller mouse interrupt is used.

8-Bit I/O Recovery Time

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

16-Bit I/O Recovery Time

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

DRAM Timings

This option specifies the RAS access time for the DRAM used in the computer for system memory. The settings are *60ns, Manual,* or *70ns.* The Optimal and Fail-Safe default settings are *60ns*.

Refresh Rate

This option specifies the system memory refresh rate. The settings are *50 MHz, 60 MHz,* or *66 MHz.* The Optimal and Fail-Safe default settings are *66 MHz.*

Turbo Read Leadoff

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

Read Burst Timing

This option sets the timing for system memory burst mode read operations. The settings are *x222, x333,* or *x444.* The Optimal and Fail-Safe default settings are *x333.*

Write Burst Timing

This option sets the timing for system memory burst mode write operations. The settings are *x222, x333,* or *x444.* The Optimal and Fail-Safe default settings are *x333.*

Fast RAS To CAS Delay (Clocks)

This option specifies the length of a delay inserted between the system memory RAS and CAS pulses in CPU clock cycles. The settings are *2* or *3*. The Optimal and Fail-Safe default setting is *3*.

Leadoff Timing

This option sets the leadoff timings. The settings are *6/5/3/4, 6/5/4/5, 7/6/3/4,* or *7/6/4/5*. The Optimal and Fail-Safe default settings are *7/6/3/4.*

Turbo Read Pipelining

Set this option to *Enabled* to enable pipelining of turbo read operations. The settings are *Enabled* or *Disabled.* The Optimal and Fail-Safe default settings are *Disabled.*

Speculative Leadoff

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

Turnaround Insertion

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

Memory Address Drive Strength

This option sets the signal strength for system memory banks 0 and 1. The settings are *8ma/8ma, 8ma/12ma, 12ma/8ma,* or *12ma/12ma.* The Optimal and Fail-Safe default settings are *8ma/8ma.*

TypeF DMA Buffer Control1

TypeF DMA Buffer Control2

These options specify the DMA channel that uses Type F DMA buffer control. The settings are *Disabled, Channel 0, Channel 1, Channel 2, Channel 3, Channel 5, Channel 6,* or *Channel 7.* The Optimal and Fail-Safe default settings are *Disabled.*

NA Disabled (NAD) for Ext Cache

Set this option to *Enabled* to disable NAD for L2 secondary (external) cache memory. The settings are *Enabled* or *Disabled.* The Optimal and Fail-Safe default settings are *Enabled.*

Peer Concurrency

Set this option to *Enabled* to enable PCI peer-to-peer concurrency. The settings are *Enabled* or *Disabled.* The Optimal and Fail-Safe default settings are *Enabled.*

ECC Test

Set this option to *Enabled* to allow an ECC (Error Checking and Correction) routine to run on system memory. The settings are *Enabled* or *Disabled.* The Optimal and Fail-Safe default settings are *Disabled.*

DRAM Data Integrity Mode

This option sets the system memory integrity mode. The settings are *Parity (system memory parity is checked)* or *ECC (an Error Checking and Correction routine is used).* The Optimal and Fail-Safe default settings are *Parity.*

SERR# Output Type

This option specifies the SERR# signal type. The settings *Normal* or *Open Drain*. The Optimal and Fail-Safe default settings are *Normal.*

SERR# Duration Mode

This option sets the type of SERR# signal that is used. The settings are *Pulse (NMI)* or *Level (NMI).* The Optimal and Fail-Safe default settings are *Pulse (NMI).*

SERR# Enable

Set this option to *Enabled* to enable the SERR# signal. The settings are *Enabled* or *Disabled.* The Optimal and Fail-Safe default settings are *Disabled.*

Single Bit Correctable Err

Set this option to *Enabled* to enable the single-bit correctable error feature. The settings are *Enabled* or *Disabled.* The Optimal and Fail-Safe default settings are *Disabled.*

Multi-bit Uncorrectable Err

Set this option to *Enabled* to enable the multiple-bit uncorrectable error feature. The settings are *Enabled* or *Disabled.* The Optimal and Fail-Safe default settings are *Disabled.*

Bad Parity on Uncorrectable Err

Set this option to *Enabled* to enable the bad parity on uncorrectable error feature. The settings are *Enabled* or *Disabled.* The Optimal and Fail-Safe default settings are *Disabled.*

PCI 2.1 Passive Release Enable

Set this option to *Enabled* to enable the PCI passive release feature defined in Version 2.1 of the PCI specification. The settings are *Enabled* or *Disabled.* The Optimal and Fail-Safe default settings are *Enabled.*

Delayed Transaction Enable

Set this option to *Enabled* to enable the delayed transaction feature. The settings are *Enabled* or *Disabled.* The Optimal and Fail-Safe default settings are *Enabled.*

Chapter 5: PCI/PnP Setup

Choose PCI/Plug and Play Setup entry from the AMIBIOS HIFLEX Setup screen to display the PCI and Plug and Play Setup options, described below.

Plug and Play-Aware OS

Set this option to *Yes* if the operating system in this computer is aware of and follows the Plug and Play specification. Currently, only Windows 95 is PnP-aware. The settings are *Yes* or *No.* The Optimal and Fail-Safe default settings *No.*

PCI Latency Timer (PCI Clocks)

This option specifies the latency timings (in PCI clocks) for all PCI devices on the PCI bus. 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

When this option is set to *Enabled,* multiple VGA devices operating on different buses can handle data from the CPU on each set of palette registers on every video device. Bit 5 of the command register in the PCI device configuration space is the VGA Palette Snoop bit (0 is disabled). For example, if there are two VGA devices in the computer (one PCI and one ISA) and the:

VGA Palette Snoop Bit Setting	Action
Disabled	Data read and written by the CPU is only directed to the PCI VGA device's palette registers.
Enabled	Data read and written by the CPU is directed to the both the PCI VGA device's palette registers and the ISA VGA device palette registers, permitting the palette registers of both devices to be identical.

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

PCI IDE Bus Master

Set this option to *Enabled* to specify that the IDE controller on the PCI local bus includes a bus mastering capability. The settings are *Enabled* or *Disabled.* The Optimal and Fail-Safe default settings are *Disabled.*

Offboard PCI IDE Card

This option specifies if an offboard PCI IDE controller adapter card is installed in the computer. You must specify the PCI expansion slot on the motherboard where the offboard PCI IDE controller is installed. If an offboard PCI IDE controller is used, the onboard IDE controller is automati-

cally disabled. The settings are *Auto (AMIBIOS automatically determines where the offboard PCI IDE controller adapter card is installed), Slot1, SLot2, Slot3,* or *Slot4.* The Optimal And Fail-Safe default settings are *Auto.*

In the AMIBIOS for the Intel Triton II ISA chipset, this option forces IRQ14 and IRQ15 to a PCI slot on the PCI Local bus.. This is necessary to support non-compliant ISA IDE controller adapter cards.

If an offboard PCI IDE controller adapter card is installed in the computer, you must also set the **Offboard PCI IDE Primary IRQ** and **Offboard PCI IDE Secondary IRQ** options.

Offboard PCI IDE Primary IRQ

Offboard PCI IDE Secondary IRQ

These options specify the PCI interrupt used by the Primary (or secondary) IDE channel on the offboard PCI IDE controller. The settings are *Disabled, Hardwired, INTA, INTB, INTC,* or *INTD.* The Optimal and Fail-Safe default settings are *Disabled.*

DMA Channel 0

DMA Channel 1

DMA Channel 2

DMA Channel 3

DMA Channel 4

DMA Channel 5

DMA Channel 6

DMA Channel 7

These options specify the bus for each DMA Channel. These options allow you to reserve DMA Channels for legacy ISA adapter cards. The settings are PnP or ISA/EISA. The optimal and fail-safe settings are PnP.

IRQ3

IRQ4

IRQ5

IRQ7

IRQ9

IRQ10

IRQ11

IRQ14

IRQ15

These options specify the bus that the specified IRQ line is used on. These options allow you to reserve IRQs for legacy ISA adapter cards.

These options determine if AMIBIOS should remove an IRQ from the pool of available IRQs passed to devices that are configurable by the system BIOS. 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 options to reserve the IRQ by assigning an *ISA/EISA* setting to it. Onboard I/O is configured by AMIBIOS. All IRQs used by onboard I/O are configured as *PCI/PnP.* IRQ14 and 15 will not be available if the onboard Triton II ISA PCI IDE is enabled. If all IRQs are set to ISA/EISA and IRQ14 and 15 are allocated to the onboard PCI IDE, IRQ9 will still be available for PCI and PnP devices, because at least one IRQ must be available for PCI and PnP devices. The settings are *ISA/EISA* or *PCI/PnP.* The Optimal and Fail-Safe default settings for IRQ3 through 7 are *ISA/EISA.* The Optimal and Fail-Safe default settings *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 *C4000.*

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Chapter 6: Peripheral Setup

Choose the Peripheral Setup entry from the AMIBIOS HIFLEX Setup screen to display the Peripheral Setup options, described below.

Onboard FDC

This option specifies WHETHER THE ONBOARD FLOPPY DISK CONTROLLER IS ENABLED. The settings are Auto, Enabled, and Disabled. The optimal and fail-safe default settings are Auto.

Onboard Serial Port 1

Onboard Serial Port 2

These options specify the base I/O port address for the serial ports. The settings are 3E8h, 3F8h, 2E8h, 2F8h, or Auto. The optimal and fail-safe default settings are Auto.

Onboard Parallel Port

This option specifies the base I/O port address for the parallel port. The settings are 378h, 278h, 3BCh, or Auto. The optimal and fail-safe settings are Auto.

Parallel Port Mode

This option specifies the parallel port mode. The settings are Normal, EPP, ECP, and Bi-Dir. The optimal and fail-safe default settings are ECP.

Onboard IDE

This option specifies the channel used by the IDE controller on the motherboard. The settings are *Disabled, Primary, Secondary,* or *Both.* The Optimal and Fail-Safe default settings are *Both.*

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Appendix B: Display Drivers and Utilities
User Guide

Software revision: 1.24
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Notice

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Table of 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 SB586T VGA.

The SB586T VGA graphics system is VGA compatible. The utilities and drivers supplied with your SB586T VGA provide support for additional features of your SB586T 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 SB586T 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 SB586T 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 SB586T VGA. The following section describes these utilities and how to use them.

CLMode is a program supplied with your SB586T 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 SB586T 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, and 1024x768.
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 SB586T 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 ren dering 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 SB586T 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 SB586T 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 SB586T 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 SB586T 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 SB586T 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 SB586T 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 SB586T 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)

INDUSTRIAL COMPUTER SOURCE®

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

declares, that the product:

SB586T100	**SB586T133**	**SB586T166**	**SB586T166X**
SB586T200	**SB586T200X**	**SB586T233X**	**SB586TS100**
SB586TS133	**SB586TS166**	**SB586TS166X**	**SB586TS200**
SB586TS200X	**SB586TS233X**	**SB586TSV100**	**SB586TSV133**
SB586TSV166	**SB586TSV166X**	**SB586TSV200**	**SB586TSV200X**
SB586TSV233X	**SB586TV100**	**SB586TV133**	**SB586TV166**
SB586TV166X	**SB586TV200**	**SB586TV200X**	**SB586TV233X**

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 72/23/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.
-IEC 1000-4-3:1995 Immunity for radiated RF electromagnetic fields.
-IEC 1000-4-4:1995 Immunity for AC and I/O lines, fast transients common mode.

EN 60950:1992 Safety of Information Technology Equipment.

September 17, 1997
San Diego, CA

Mr. Steven R. Peltier
President & Chief Executive Officer

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

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B.P. 712
Villebon-Sur-Yvette
91961 COURTABOEUF Cedex

Declaration of Conformity

According to 47cfr, Parts 2 and 15 for

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SB586T100	**SB586T133**	**SB586T166**	**SB586T166X**
SB586T200	**SB586T200X**	**SB586T233X**	**SB586TS100**
SB586TS133	**SB586TS166**	**SB586TS166X**	**SB586TS200**
SB586TS200X	**SB586TS233X**	**SB586TSV100**	**SB586TSV133**
SB586TSV166	**SB586TSV166X**	**SB586TSV200**	**SB586TSV200X**
SB586TSV233X	**SB586TV100**	**SB586TV133**	**SB586TV166**
SB586TV166X	**SB586TV200**	**SB586TV200X**	**SB586TV233X**

Signature of Party Responsible:

Printed Name of Party Responsible: Mr. Steven R. Peltier
President & Chief Executive Officer

Executed on (Date), at (Place): September 17, 1997
San Diego, CA

BUG REPORT

While we have tried to assure this manual is error free, it is a fact of life that works of man have errors. We request you to detail any errors you find on this BUG REPORT and return it to us. We will correct the errors/problems and send you a new manual as soon as available. Please return to:

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Product: **SB586T Series Single Board Computer**

Manual Revision: **00431-220-3C**

Please list the page numbers and errors found. Thank you!