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zPM11

Super VGA PCI Mezzanine Adapter

H A R D W A R E M A N U A L

Revision B

ZIATECH CORPORATION

ZT MzPM11
February 19, 1998
10225501

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WHAT'S IN THIS MANUAL

This manual describes the operation and use of the zPM11 Super VGA PCI Mezzanine Adapter.

Chapter 1, "Introduction," offers an introduction to the zPM11 Super VGA PCI Mezzanine Adapter. It includes a product definition and a listing of product features.

Chapter 2, "Getting Started," summarizes the information you need to get your zPM11 operational. This includes system requirements, recommendations, and hardware/software installation. You should read this chapter in its entirety before you use the zPM11.

Chapter 3, "Functional Blocks," presents a functional block diagram and a detailed description of each block of the zPM11.

Chapter 4, "Software," provides information about the video BIOS and installation instructions for the drivers and utilities included with the zPM11.

Chapter 5, "DOS Drivers and Utilities," provides detailed instructions for using the CLMode, TSRFONT, and Autodesk ADI 4.2 drivers and utilities included with the zPM11.

Chapter 6, "Microsoft Windows 3.x," includes insturctions for Windows 3.x driver installation, reconfiguring Windows 3.x, and Display Power Manager for Windows 3.x, a mechanism to control the amount of power used by a computer's monitor.

Chapter 7, "Microsoft Windows 95," includes instructions for installing the Windows 95 drivers and setting color depth, resolution, refresh rate, and display type.

Chapter 8, "Microsoft Windows NT 4.0x," contains information on installing Windows NT drivers and adjusting resolution and color depth.

Appendix A, "Specifications," contains the electrical, mechanical, and environmental specifications for the zPM11.

Appendix B, "Video Modes," provides a guide to the video modes available on the zPM11.

Appendix C, "Customer Support," offers technical support information, a product revision history, and instructions for returning the zPM11 if service is necessary.

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CHAPTER 1. INTRODUCTION

This chapter provides a brief introduction to the zPM11 Super VGA PCI Mezzanine Adapter. It includes a product definition and a list of product features. Unpacking information and installation instructions can be found in Chapter 2, "Getting Started".

PRODUCT DEFINITION

The zPM11 is a Super VGA PCI mezzanine adapter board. The zPM11 utilizes the Peripheral Component Interconnect (PCI) bus to give exceptional video performance. The PCI bus supports 32 bits of data and runs at speeds up to 33 MHz giving it a theoretical bandwidth of 132 Mbytes/s.

The zPM11 is based on a 64 bit GUI VGA controller which incorporates a Bit Block Transfer (BitBLT) engine and a 24-bit true-color DAC. The zPM11 can support display resolutions up to 1600 x 1200 and color modes with up to 16.8 million colors. The zPM11 can be ordered with up to 4 Mbytes of fast page mode EDO DRAM allowing it to support display resolutions up to 1600 x 1200 x 256 colors.

FEATURES OF THE zPM11

- IBM VGA compatible
- 32-bit, 33 MHz high performance PCI bus interface
- VGA and VESA® compatible BIOS
- Hardware BitBLT for Microsoft Windows™ and other GUIs
- Supports up to 4 Mbytes of fast page mode EDO DRAM video memory - 2 Mbytes standard
- 24-bit true-color DAC supports up to 16.8 million colors
- Optional Feature connector
- Multimedia support - overlay, color keying, Genlock
- 1600 x 1200 x 256 colors, interlaced
- 1280 x 1024 x 64K colors, interlaced
- 1024 x 768 x 64K colors, non-interlaced
- 800 x 600 x 16M colors, non-interlaced

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CHAPTER 2. GETTING STARTED

This chapter summarizes the steps required to get the zPM11 running. You should read this chapter in its entirety before you use the board.

UNPACKING

Please check the shipping carton for damage. If the shipping carton and contents are damaged, notify the carrier and Ziatech for an insurance settlement. Retain the shipping carton and packing material for inspection by the carrier. Do not return any product to Ziatech without a Return Material Authorization (RMA) number. The topic "Returning For Service" in Appendix C explains the procedure you should follow to obtain an RMA number from Ziatech.

WHAT'S IN THE BOX?

After opening the shipping container, check for the following contents:

- The zPM11 Super VGA PCI Mezzanine Adapter
- On-Line Help disk for the zPM11
- The zPM11 Drivers and Utilities diskettes (if ordered)
- Nylon standoff - attached to board
- Paper version zPM11 Hardware Manual (if ordered)

If any of the above items are missing, contact Ziatech for assistance. Be sure to save the anti-static packing material for storing or shipping.

WARNING!

Like all equipment using MOS devices, the zPM11 must be protected from static discharge.

SYSTEM REQUIREMENTS

The zPM11 Super VGA PCI Mezzanine Adapter is designed to work with CPU boards that adhere to the CompactPCI™ mezzanine specification. The zPM11 piggybacks onto the CPU board using the 150-pin CompactPCI mezzanine connector.

The zPM11 requires +5 VDC ± 5% @ .840 A maximum and .640 A typical. The ambient temperature must be maintained between 0° and +65° Celsius to avoid improper operation and possible damage. The relative humidity should be less than 95%, non-condensing.

The I/O and memory map for the zPM11 varies according to the video mode. For the safest operation, allowing all modes to be used, I/O ports 100h through 104h, 46E8h, and 3B0h through 3DFh, as well as memory addresses A0000h through BFFFFh, should be reserved. The C0000h through C7FFFh range should also be reserved for the video BIOS. If linear addressing is used, the PCI BIOS will allocate a 16 Mbyte block of memory.

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SYSTEM RECOMMENDATIONS

The following topics discuss connecting to the analog video interface and the optional Feature connector.

Analog Video Interface

The zPM11 must be used with an analog monitor. If your monitor is capable of both digital and analog modes, be sure it is set to analog.

Discussion of monitor timing specifications for supporting various display modes is provided in Appendix B.

The zPM11 can be used in a wide variety of video applications. There are several considerations, however, that you must take into account when setting up a video system to ensure the best quality display. Such factors as environment, noise from surrounding equipment, video mode, distance from video source, and cabling all come into play.

The analog video signals are comprised of a horizontal and vertical sync and three color signals (red, green, and blue). The signals are driven by a RAMDAC which is used to convert the digital video data to analog signals. The RAMDAC's analog outputs have an impedance of 75Ω. Ideally, the connection to this output should use high quality 75Ω shielded cable. See Chapter 3, "Output Connectors" for more information

Feature Connector

The zPM11 has an optional connector location for a Feature connector that can be used for video overlay applications or to drive flat panel displays that use a Feature connector interface (i.e., Planar EL640.480-A). The Feature connector uses a 26-pin, double row, 0.100 inch spaced header. The connector is located at the edge of the zPM11 near the video BIOS socket.

The Feature connector signals come directly from the VGA controller and consist of the same signals that are fed to the RAMDAC for producing the analog display. This data is fed at the pixel clock rate of the VGA controller. Depending on the graphics mode used, this can range from 12 to 28 MHz for standard VGA modes. The Feature connector's useable upper limit is approximately 40 MHz, which corresponds to a maximum resolution of 800 x 600. Because the Feature data can be at such a high clock rate, you must be careful when cabling to the connector. As with any high speed data cable, pay careful attention to noise reduction. Standard 28 gauge unshielded flat cable will work fine for short distances but at longer lengths noise will begin to degrade the system and cause pixel streaking. Shielded cable can be used for applications that require longer distances.

HARDWARE INSTALLATION

The zPM11 is designed to plug into a 150-pin CompactPCI mezzanine connector and a 16-pin video output connector. Steps for installing the zPM11 onto a CPU board are as follows:

WARNING!

Installation of the zPM11 must be done at a static-free workstation to avoid damage to the CPU board and the zPM11.

1. Turn off the power and remove the CPU board from the card cage.
2. Remove the screw from the open end of the nylon standoff on the zPM11.

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3. Place the zPM11 module over the 150-pin and 16-pin connectors on the CPU board with the component side down (the zPM11 components should be facing the CPU board's components). Align the connectors and nylon standoff. Push down on the zPM11 until the connectors seat.
4. Install the standoff screw to secure the CPU board and zPM11 together. Your board is now ready for installation into the card cage.
5. Connect the monitor to the 15-pin DIN video connector found on the CPU frontplate (the video signals for the zPM11 are passed down to the CPU through the 16-pin connector on the zPM11).
6. Power up the system.

Caution: Care should be taken when connecting and removing the zPM11 from the CPU board to prevent premature wear of the 150-pin and 16-pin connectors. When removing the zPM11, try to remove the board evenly instead of prying only from one side.

Jumpers

Since the zPM11 uses the PCI bus, which has been designed to support automatic configuration, there are no jumper options for the board.

SOFTWARE INSTALLATION

Included with the zPM11 are software drivers and utilities to increase the performance and resolution of specific software packages such as Microsoft Windows® 3.x, Windows 95, and Windows NT.

Four (4) drivers and utilities disks are included with the zPM11. Programs are provided on each disk to facilitate the installation of these drivers and utilities. The installation programs are self contained and guide the user through the installation procedure.

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 zPM11 display drivers. In other cases, loading the display driver may be an integral part of the vendor's product installation process.

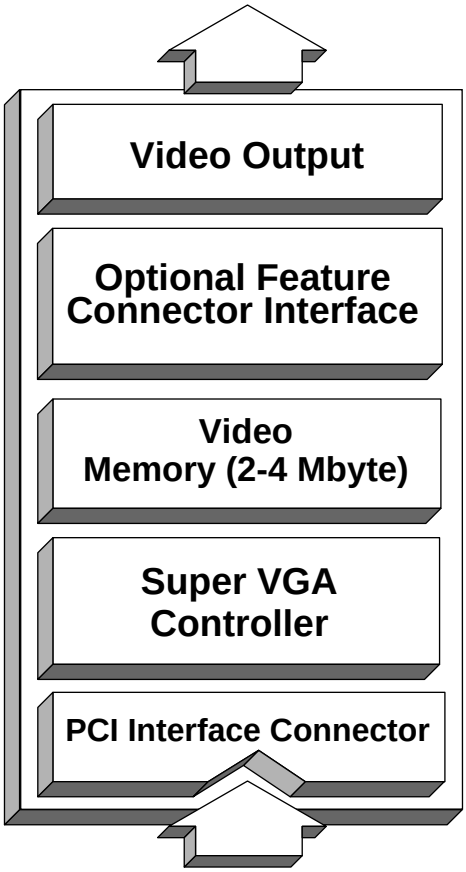
See Chapter 4 "Software" for instructions on installing the drivers for each operating system.

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CHAPTER 3. FUNCTIONAL BLOCKS

The following section gives a detailed description of the hardware components found on the zPM11. A block diagram of the zPM11 is shown below.



zPM11 Functional Block Diagram

CPU INTERFACE

The zPM11 connects to the CPU through the 150-pin J1 CompactPCI Mezzanine Connector. The interface consists of a 32-bit data/address bus (this bus also handles various control signals for PCI transfers). See the "J1 CompactPCI Mezzanine Connector Pinout" table for pin definitions.

The zPM11 supports bus speeds up to 33 MHz, giving a theoretical bandwidth of 132 Mbytes per second. The PCI bus allows the zPM11 to support the most demanding graphic applications while not taking away bandwidth from the backplane bus.

The connector pinout adheres to the CompactPCI mezzanine standard and can be used on other boards that support this standard. For more information on the CompactPCI standard contact Ziatech.

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VGA CONTROLLER

The zPM11 is based on the Cirrus Logic 5446 VGA controller. This controller is a highly integrated 64-bit GUI engine that has been optimized for handling graphic-intensive environments such as Windows and OS2. The controller uses a 64-bit data path to the video memory, allowing it to surpass many VRAM based controllers in performance. In addition, the 5446 contains several other performance enhancers such as a BitBLT accelerator, linear addressing, hardware cursor, color expansion, and memory mapped I/O.

The 5446 is hardware register compatible with the IBM VGA standard and can support resolutions up to 1600 x 1200. The 5446 contains an integrated 24-bit RAMDAC, allowing the display of 16.8 million colors.

VIDEO MEMORY

The zPM11 can be ordered with up to 4 Mbytes of high speed fast page mode EDO DRAM, allowing it to support high resolution color graphics modes such as 1280 x 1024 x 64K colors. The memory is organized as eight 256K x 16-bit DRAMs. The Cirrus Logic 5446 controls accesses to the display memory and arbitrates between the display refresh requirements and CPU accesses. The address space occupied by the video memory depends on the video mode selected. The "Display Memory Address Map" table summarizes the address space for various video modes.

In order to allow for all possible modes of operation, memory address space from A0000 to C7FFFh should be reserved for the display memory and video BIOS. If certain video modes, such as monochrome text, are not used, it is possible to use the memory address space corresponding to the unused mode.

The Cirrus Logic drivers for Windows (supplied on the Drivers and Utilities diskettes) use linear addressing to increase performance. Linear addressing allows the controller to see a contiguous area of memory instead of 64K pages as with the standard VGA implementation. The zPM11's linear addressing region is mapped by the PCI BIOS as a 16Mbyte block in upper memory.

Appendix B contains specifications on the various video modes supported by the 5446 and the memory requirements for each mode.

Display Memory Address Map

	MEMORY MAP			
Video Mode	A0000-AFFFFh	B0000-B7FFFh	B8000-BFFFFh	Upper Memory 16Mbyte
Color Text Modes	-	-	X	-
Mono Text Modes	-	X	-	-
VGA Graphics	X	-	-	-
Extended VGA Graphics	X	X	X	X

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OUTPUT CONNECTORS

The zPM11 includes two output connectors. The topics that follow provide descriptions of the individual connectors. Connector assignments are listed below.

J2 Optional Feature connector

J3 Video Output connector

Optional Feature Connector

J2 is an Optional Feature Connector available for video overlay applications or for driving flat panel displays that use a Feature connector interface. The Feature connector uses a 26-pin, double row, 0.100 inch spaced header and is located at the edge of the zPM11 near the video BIOS EPROM socket. See the "J2 VESA Optional Feature Connector Pinout" table in Appendix A for pin definitions.

Video Output Connector

J3 is a 16-pin, dual row, 2 mm Video Output Connector that is used to pass the video signals down to the CPU. See the "J3 Video Output Connector Pinout" table in Appendix A for pin definitions.

VIDEO SELECT CIRCUITRY

A unique feature of the zPM11 is its ability to share monitors and keyboards with other zPM11s when in a Ziatech STD 32 STAR SYSTEM™. This feature is controlled by the CPU's on-board video/keyboard select circuitry. The circuitry consists of a video switch and a software-controlled video select signal. Up to seven zPM11s can be daisy chained in a STAR SYSTEM to share a common display and keyboard. Using software control, you can "hot key" to the next single board computer in the system with a simple <Ctrl> <Alt> <Spacebar> key sequence.

The software control for the video select circuitry has been incorporated into the STAR SYSTEM BIOS and is thus transparent to the user. For more information on this function, see your *STD 32 STAR SYSTEM User's Manual.*

Caution: When developing multi-video applications, debug the software thoroughly to prevent the possibility of more than one zPM11 driving the video and keyboard at the same time. **A condition that could cause permanent damage to the zPM11.**

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CHAPTER 4. SOFTWARE

Software for the zPM11 consists of the video BIOS, utilities for performing various video control functions, and drivers for specific applications.

This chapter provides information about the video BIOS and installation instructions for the drivers and utilities.

Chapters 5-8 provide detailed instructions for using the various drivers and utilities included with the zPM11. Because the drivers and utilities are continually updated, be sure to read the README.DOC file on your disks for the latest information and instructions.

VIDEO BIOS

The video BIOS provides for low-level control of the VGA controller. It is used to interpret higher-level commands and transform them into register-level instructions that the VGA controller can understand. The zPM11's BIOS is fully IBM VGA and VESA compatible. The BIOS is contained in a 32K EEPROM located on the zPM11. It is automatically installed during system initialization and is mapped to the standard 0C000 to 0C7FFh VGA BIOS memory space.

DRIVER AND UTILITY INSTALLATION

Four software disks are included with the zPM11. These disks contain the following:

Disk 1 DOS drivers and utilities

Disk 2 Windows 3.x drivers and utilities

Disk 3 Windows 95 drivers

Disk 4 Windows NT drivers

Installation utilities have been provided on each disk to facilitate smooth installation.

Note that some display drivers need to have the associated vendor's application program already installed on the system prior to loading the display drivers. In other cases, loading the display driver may be an integral part of the vendor's product installation process.

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CHAPTER 5. DOS DRIVERS AND UTILITIES

The zPM11 comes with a set of DOS drivers and utilities that allows you to take full advantage of the VGA controller's capabilities. Below is a list of the DOS drivers and utilities included with the zPM11 and a brief description of their function.

CLMODE - a DOS program for configuring the video modes supported by the zPM11.

TSRFONT - a TSR program that makes a full 8x14 size character set available to programs that bypass the BIOS and draw characters directly on the screen.

AUTODESK ADI 4.2 - A DOS driver for speeding up AutoCAD redraws, pans and zooms.

CLMODE

The CLMode DOS utility allows the user to define the type of monitor attached, and set the video modes supported by the zPM11.

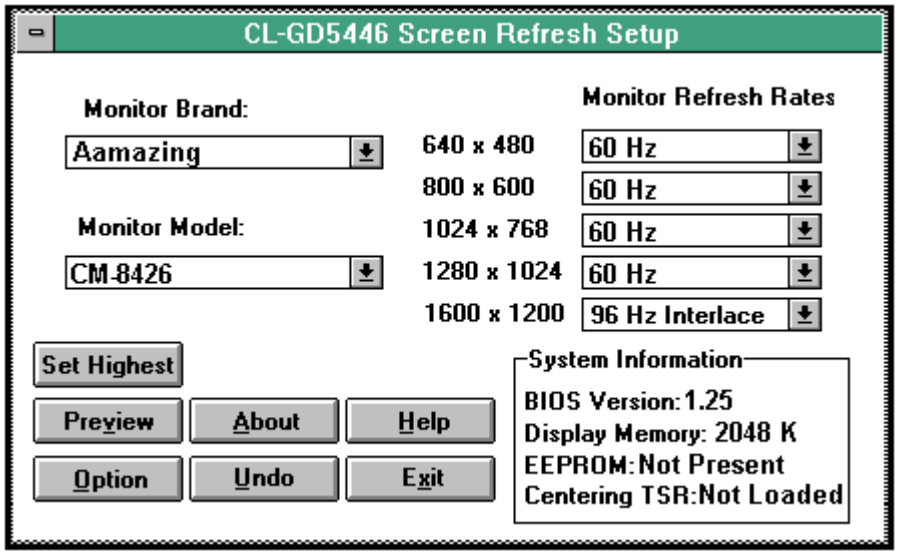
Using CLMode's Menu-Driven Interface

Change to the directory that contains the CLMode utility. At the DOS prompt type:

```
CLMODE[Enter]
```

The CLMode Setup Window consists of a number of buttons, each representing a different option or menu. The underlined letter of a button name specifies the hot key combination for that item. Press [Alt] and the underlined letter keys simultaneously to select an option.

Note: to use a mouse pointer for button selection, a mouse driver must be installed prior to running the CLMode utility.



CLMode Setup Window

Choosing the Monitor Brand/Model

Selecting the proper monitor brand/model allows the zPM11 to display the highest quality output of which it is capable with the attached monitor. The monitor model determines the video modes that are available to your system. It also determines the vertical refresh rates available. Generally, the higher the refresh rate, the better the screen looks. From the CLMode Setup Window:

1. Select the **Undo** button at any time to void the operation.
2. Select the **Monitor Brand** text box. Use the up/down arrows to select your monitor brand. If your monitor brand is not shown then select "other brand."
3. Select the **Monitor Model** text box. Use the up/down arrows to select your monitor model. If your model is not shown, then select "other model."
4. Customize the monitor timings by setting the desired refresh rate for each resolution:
   a. Consult the manual for your monitor to determine the correct rate for each resolution.
   b. Select the **Monitor Refresh Rate** text box for each resolution and use the up/down arrows to set the correct rate.
5. Before saving the new monitor type, you may view each of the new video timings and check that they are compatible with your monitor (see the "Video Modes Preview" and "Centering Adjust" topics in this chapter).
6. When all of the settings are correct, select the **Exit** button.

Video Modes Preview

You can preview each of the video timings set in the CLMode Setup Window to check that they are compatible with your monitor.

1. Select the **Preview** button on the main setup window to display the Video Modes Preview window.
2. Display each test screen from this window.
3. After each test screen is displayed, press [Enter] or the left mouse button to see the next video mode.
4. If there is a problem, press [Esc] or the right mouse button to return to the Preview window.

Try slower settings for any resolutions that did not work and verify your choices again.

Centering Adjust

Centering is available while in the **Video Modes Preview** window (only for extended Graphics modes 58h and greater). You can use the Right/Left/Up/Down arrow keys to adjust your screen accordingly.

The screen adjustments have predefined limits. For some modes, the right side adjustment limit will have already been reached when entering the **Preview** mode. In that case, no right side adjustment is allowed.

After centering, the new horizontal and/or vertical values are saved within CLMode. Additionally, when exiting CLMode, you are prompted on whether you want to save these new values to TSR (CENTER.COM). If you choose to do this, the new values are stored in CENTER.COM allowing them to be loaded outside of CLMode. Then, the modes that have been adjusted are set as the active modes 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 defined. To save new centering adjustments for a different monitor type, repeat the above procedure. Your new adjustments are written into CENTER.COM over the previously defined adjustments.

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An additional adjustment for monitor SYNC POLARITY is available while centering is active. To adjust the polarity of the current mode, 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 is 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.

Retrieving the Current VGA Controller Status

Information displayed in the CLMode Setup Window includes the VGA controller type, the BIOS version number, and the amount of video memory present.

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 CLMode Setup Window (i.e., the top left corner button of the window, shown as a bar), or select the **Exit** button. When the CLMode utility exits, the current video mode, monitor type, and VGA refresh rate are displayed.

When CLMODE is exited, the settings are saved to the on-board EEPROM. These settings are automatically loaded by the video BIOS the next time the board is powered up. Note that CLMODE does not show the EEPROM present until it has been initialized. The presence of the EEPROM can be confirmed in the System Information Box of the main CLMode window.

Since the settings are saved to the EEPROM, the zPM11 always powers up using these modes and refresh rates. Make sure to reset the zPM11 to the default values (all modes using 60 Hz refresh rates) before switching to a different monitor that might not be able to handle the previous modes and refresh rates.

Using CLMode's Command Line Options

When command line options for CLMODE.EXE are given at the DOS prompt, the menu-driven windows are not displayed. Instead, configuration, monitor type, video mode and refresh rate are set at the DOS prompt. The command line options for CLMODE.EXE are listed below:

T640=Hz, where Hz = [60] [72] [75] [85]
T800=Hz, where Hz = [56] [60] [72] [75] [85] [0]
T1024=Hz, where Hz = [87] [60] [70] [72] [75] [85] [0]
T1280=Hz, where Hz = [87] [60] [72] [75] [0]
T1152=Hz, where Hz = [70] [75] [0]
T1600=Hz, where Hz = [96] [0]

Note: 0 means set it as unavailable.

[Mode Number][+/*/-]

- **+** selects 400 scan lines (default)
- ***** selects 350 scan lines
- **-** selects 200 scan lines

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TSRFONT DRIVER

Some DOS application programs bypass the BIOS and draw characters directly to the screen. Programs that directly draw characters using the 8x14 font from the BIOS appear to be writing incorrect data to the screen. Typically this can occur in programs that 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 makes a full 8x14 size character set available to these programs, and should correct the type of display errors discussed above.

To run the TSRFONT driver, type:

```
TSRFONT [Enter]
```

If you want to run TSRFONT automatically when you turn on your computer, add it to your AUTOEXEC.BAT file.

AUTODESK - ADI 4.2

The ADI 4.2 driver provided with your zPM11 is the TurboDLDClassic™ display list driver from Panacea. It has 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 with 3D Studio to provide enhanced rendering support, but does not affect the speed of these programs since they do not support Display Lists.

Installing TurboDLDClassic does not change any of the AutoCAD program files or alter any of the drawing files stored on disk. TurboDLDClassic is designed to make using AutoCAD faster and more productive.

The driver does three things to speed operation:

1. AutoCAD stores drawings in a hierarchical structure, intermixing simple elements with complex ones. Every time the screen is updated, AutoCAD must decode this structure. However, TurboDLDClassic translates the normal hierarchical structure into a Display List, a series of vectors or polygon fills. When you pan or zoom, TurboDLDClassic 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. TurboDLDClassic also maintains a Drawing Cache. The Drawing Cache is a compressed list that 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. TurboDLDClassic gives you numerous new user-interface features, such as the bird's eye view.

PANs and ZOOMs, aided by the Display List alone, 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 TurboDLDClassic, compared to the graphics drivers shipped with AutoCAD Features.

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Autodesk - ADI 4.2 Features

The features provided by TurboDLDClassic 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 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 features, including rendering to viewports and 31-bit regen space.

Autodesk - ADI 4.2 Requirements

TurboDLDClassic requires a '386, '486, or Pentium® processor-based PC that supports AutoCAD Release 12, 11/386, AutoShade 2 with RenderMan, or 3D Studio V1.x/2.x.

Additional extended memory is recommended for optimal performance. The driver actively uses about 300 Kbytes 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's 31-bit regen space.

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

Autodesk - ADI 4.2 Installation

1. Insert the DOS Drivers and Utilities diskette into Drive A: (or B:).

2. Run the installation program (INSTALL.EXE).

3. Choose the option for the Autodesk/AutoCAD drivers.

4. Specify the drive and directory in which you want the drivers copied (such as C:\ACAD\DRV).

Since the startup is a little bit different for AutoCAD Release 12 than it is for older versions, please follow the instructions for the version of AutoCAD that you are using with TurboDLDClassic.

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To Configure AutoCAD 12

1. Begin AutoCAD with the reconfigure switch by typing:

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

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

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

4. Select **TurboDLDClassic by Panacea Inc.** from the list of display options.

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

To Configure AutoCAD 11/386

1. Run FASTACAD.BAT, which was copied to the TurboDLDClassic sub-directory, by typing:

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

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

2. Start AutoCAD and reconfigure it to use TurboDLDClassic by selecting option 5, **Configure AutoCAD** from the AutoCAD main menu.

3. From the next menu, select option 3, **Configure Video Display**.

4. Choose Item 1, **P386 ADI 4.0/4.1** (R11) as your display device. (For more information, see your AutoCAD Installation and Performance Guide.)

TurboDLDClassic Configuration

After selecting the proper display device, the TurboDLDClassic driver configuration menu appears.

Setup of TurboDLDClassic 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 completes 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 returns 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 is automatically configured for Generic VGA, 640 x 480 resolution at 16 colors.

Select Graphics Board/Resolution

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

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

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- **Select Display Resolution** - Selects AutoCAD, 3D Studio and AutoShade main display screen resolutions
- **Select Rendering Resolution** - Selects AutoCAD 12, 3D Studio and AutoShade rendering resolutions

Note: When configuring TurboDLDClassic*'s* display options, the Rendering Board/Resolution options described below appear *ONLY* when configuring AVE Render, 3D Studio, or AutoShade. Otherwise, the Display Board/Resolution options are the only menu choices available.

Basic Configuration

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

- **AutoCAD Text Lines** - Selects the number of lines in the 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 the 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

User Interface options include 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 TurboDLDClassic*'s* Big Picture pop-up. This value 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 results 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 the mouse/digitizer button to display the Big Picture (BP). With the BP Button option, TurboDLDClassic 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 BP appears on the screen.

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  - Patt Line displays the BP using dotted lines to form the outer bounding box and the zoom crosshairs.
  - XOR Rect uses a contrasting rectangle to display the BP.
  - The Both option use a combination of Patt Line and XOR Rect to distinguish the BP.

- **BP Refresh** - In its fastest mode, TurboDLDClassic does not refresh the BP until a DLDREFRESH command is issued. Depending on a drawing's complexity, the BP could become confusing in this mode, displaying vectors that are actually erased, and no longer part of the drawing. To configure the BP 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 TurboDLDClassic*'s* internal memory cache for BP functions. This cache speeds up BP 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%.

Expert Configuration

The Expert Configuration menu sets the function of TurboDLDClassic 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 TurboDLDClassic. This option should always be set to enable since disabling the Display List causes TurboDLDClassic to run as an ordinary non-display list driver.
- **Drawing Cache** - Enables or disables TurboDLDClassic*'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 frees 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, this option configures TurboDLDClassic for use with AutoCAD R12's 31-bit logical drawing space. When set to Yes, the driver uses AutoCAD's extended 31-bit drawing space. Selecting No uses 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 TurboDLDClassic 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 TurboDLDClassic internal commands can be enabled or disabled with the Internal Command Echo option. If you would like to see TurboDLDClassic*'s* internal commands display at the AutoCAD command line as they are executed, enable this option.
- **Big Picture Zoom Mode** - Sets the 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 locks the current BP contents into place to provide a better overall frame of reference.

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- **Regen Mode**
  - Fast Regen mode stores the AutoCAD drawing until the Display List is created, and then displays it, all at once.
  - 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

1. Use the arrow keys to scroll down to the **Save and Exit** option and then press the `[Enter]` key to continue.
2. Configure the AutoCAD screen display characteristics and type `[Y]` to accept the changes.
3. Exit to the AutoCAD drawing editor to begin using TurboDLDClassic. 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 TurboDLDClassic is to configure the colors for AutoCAD.

1. From the AutoCAD Command Line, type `DLDCOLOR[Enter]`, to start CustomColors, TurboDLDClassic*'s* color configuration utility.
2. Make any desired color changes.
3. Save the new color palette, and then exit to return to the drawing editor.

Verifying Your TurboDLDClassic Installation

To verify that TurboDLDClassic 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 TurboDLDClassic is loaded and running, this command should return your current version and serial number.

Reconfiguring TurboDLDClassic

To reconfigure TurboDLDClassic, follow the instructions in the following topics for your version of AutoCAD, Release 12 or Release 11.

AutoCAD Release 12

If you need to make changes to your Release 12 TurboDLDClassic configuration,

1. Type `CONFIG[Enter]` at the AutoCAD command prompt or use `ACAD -R[Enter]` when starting the program.
2. Select option 3, **Configure Video Display**.
3. Answer `No[Enter]` to the **Select a new videodriver...** prompt to start the TurboDLDClassic configuration program.
4. Make the desired changes to the driver and then **Save and Exit** to continue to the AutoCAD drawing editor.

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To completely reconfigure TurboDLDClassic using Panacea's defaults,

1. Delete DLDSETUP.DAT from the \ACAD\DRV sub-directory.
2. Follow the TurboDLDClassic Configuration instructions earlier in this chapter.

AutoCAD Release 11

If you need to make changes to your Release 11 TurboDLDClassic configuration,

1. Select option 5, **Configure AutoCAD** from the AutoCAD main menu.
2. From the configuration menu, select option 3, **Configure Video Display**.
3. Answer no to the **Select a new video driver...** prompt to start the TurboDLDClassic configuration program.
4. Change the desired driver options.
5. **Save and Exit** to return to the AutoCAD configuration menu.
6. Open or begin a new drawing.

To completely reconfigure TurboDLDClassic using Panacea's defaults,

1. Delete DLDSETUP.DAT from the TURBODLD sub-directory.
2. Follow the TurboDLDClassic Configuration instructions earlier in this chapter.

Configuring an AutoCAD 11 Environment

During the TurboDLDClassic 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 TurboDLDClassic to find all of its configuration files
- DSPADI, RCPADI, and RDPADI - used by AutoCAD, 3D Studio, and AutoShade 2 with RenderMan, respectively, to find the driver file.

FASTACAD.BAT must be run prior to starting AutoCAD R11 and needs to be run only once per system boot. For automatic loading of the environment variables, you may add FASTACAD.BAT to the AUTOEXEC.BAT file or an AutoCAD startup 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 that 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 need to enlarge your system's environment. This is accomplished by adding the following line to your CONFIG.SYS file:

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

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

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Configuring AutoShade

To configure AutoShade V2.0 to use TurboDLDClassic,

1. Run the FASTACAD.BAT file from your TurboDLDClassic subdirectory to set the AutoShade environment variables.
2. Start AutoShade with `SHADE /R[Enter]`. This allows you to reconfigure AutoShade.
   - For the display device, select P386 Autodesk Device Interface display driver.
   - 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 requires a redraw of the display screen after a rendering screen.
3. Follow the installation steps under the previous topic "To Configure AutoCAD 12" to select the graphics board and display/rendering resolutions.

Configuring 3D Studio Release 1.x and 2.x

Configuring 3D Studio requires the following steps.

1. Set the environment variables for 3D Studio by running the PANA3DS.BAT file located in your TurboDLDClassic subdirectory.
2. 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.

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

   > **Note:** 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 TurboDLDClassic are configured for 256 color resolutions. An unpredictable Materials Editor screen appears 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. Please note that the use of the Materials Editor does not give you any more colors to choose from.
3. Save the above changes.
4. From your 3D Studio directory, delete the file 3DADI.CFG by typing:

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

   This causes 3D Studio to start in its reconfiguration mode.

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5. 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 TurboDLDClassic configuration program appears. Select a graphics board, display, and rendering resolutions as you would for AutoCAD use.

   Because RCPADI device drivers, by definition, are combined display and rendering devices, you are brought to the TurboDLDClassic configuration menu during 3D Studio reconfiguration twice: once each for display and rendering. It is not necessary to select display and/or rendering resolutions the second time. Simply press the `[Enter]` key to remove the help screen and then highlight **Save and Exit** to continue to the next question.

   If FASTACAD.BAT is used instead of PANA3DS.BAT to define the AutoCAD operating environment, the TurboDLDClassic configuration menu also appears for RDPADI and DSPADI devices if they are present.

Configuring 3D Studio V3.x

Panacea's TurboDLDClassic drivers 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 Subdirectory, run PANA3DS.BAT to set the 3D Studio environment settings.

Run 3DS VIBCFG.

During Configuration for Vibrant Graphics there are four categories:

- Main-Display
- Materials-Display
- Render-Display
- Flic Playing.

Set RCPADI for these four categories.

When Vibrant Graphic settings are complete, click OK to exit and save settings. The Setup for TurboDLDClassic Drivers commences. Follow the menus to **Setup Display and Rendering Screen**. Save and Exit to 3D Studio.

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

Note: TurboDLDClassic only provides still rendering support for 3D Studio. TurboDLDClassic does 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, 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.

Configuring AVE Render

AutoCAD 12's AVE Render uses TurboDLDClassic*'s* rendering capabilities to render objects and drawings.

First Time Configuration

If AVE Render has never been configured, you are forced to run through the configuration process when you first select the AutoCAD render command. You are prompted as follows.

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1. Select a Rendering Display Device. Since TurboDLDClassic 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:
   a. The TurboDLDClassic configuration program appears on the screen. Press the `[Enter]` key to continue past the help screen and display the Rendering Configuration menu.
   b. Choose **Select Graphics Board/Resolution** to display graphics board and resolution menu selections.
   c. Choose **Select Render Graphics Board** to select the graphics board to be used for renderings.
   d. Choose **Select Render Resolution** to select the desired rendering resolution from the list of available choices.
   e. Select **Return to Previous Menu**.
   f. Select **Save and Exit**.
3. Select **Render Mode,** then select the rendering mode for TurboDLDClassic. 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 does 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, return to the drawing and render it.

Reconfiguration

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**. The TurboDLDClassic configuration program appears on the screen.
3. Configure the rendering graphics board and resolution.
   a. Press the `[Enter]` key to continue past the help screen and display the **Rendering Configuration** menu.
   b. Choose **Select Graphics Board/Resolution** to display graphics board and resolution menu selections.
   c. Choose **Select Render Graphics Board** to select the graphics board to be used for rendering.
   d. Choose **Select Render Resolution** to select the desired rendering resolution from the list of available choices.
   e. Select **Return to Previous Menu** and then **Save and Exit**.
4. Select the rendering mode for TurboDLDClassic. 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 does not allow a render to viewport selection.

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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

The CustomColors configuration utility included with TurboDLDClassic gives you the ability to modify all of the 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. Type DLDCOLOR[Enter] at the AutoCAD drawing editor command line 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 allows 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 appears 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 quickly redraws with the new color selection for the object you have chosen, and returns to the start of object selection, allowing you 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 provides 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 box appears in the drawing color area of the simulated AutoCAD display. The box 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. Press [Enter] and 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 appears in the row of 16 physical colors at the bottom of the screen.

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Use the arrow keys to select the color you wish to edit and press [Enter]. Three sliders appears 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. 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 rounds it to the nearest intensity that 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 the 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 change hue, allowing you to visually determine the most appropriate setting for your display. Press [Enter] to set the RGB values you have selected for the physical color you are modifying.

- **ADIreset** - constructs a default ADI color palette, as defined in the Autodesk Device Interface Driver Development Kit. This command will wipe out unsaved color changes. Use it 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.
- **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. This command will wipe out unsaved color changes. Use it 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.
- **Load** - reloads the color information from the file DLDCOLOR.DAT. It is 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 is displayed. This command is useful if you have made mistakes in configuring your colors and you want to go back to your previous color configuration. This command will wipe out unsaved color changes.
- **Save** - Saves the current color palette to DLDCOLOR.DAT. It is 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 are 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 has no visible effect until a **Save** and **Exit** occurs.

TurboDLDClassic Commands

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

Commands with a dagger "†" following them, when issued within AutoCAD, override the selections made during TurboDLDClassic configuration for the current drawing session only. Exiting, then restarting AutoCAD, causes all feature settings to revert back to those selected in the TurboDLDClassic configuration menu. If you wish to make the current changes permanent, reconfigure TurboDLDClassic.

The most important feature of TurboDLDClassic is the addition of a world view called the Big Picture™ or BP for short. Bringing up the BP allows you to view where you are located in your

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current drawing in your active viewport. It also gives you the ability to dynamically move to another part of the drawing without having to cancel 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 double click BP Button). This brings up the BP on the display. Cross-hairs and a highlighted section indicate which part of the whole drawing you are currently viewing - the size of the image is determined by the AutoCAD logical drawing space being used, 15-Bit or 31-Bit. The selection or pick box has 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 has 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 reduces the size of the contents of the BP. Pressing the `[Home]` and `[End]` keys puts 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 puts 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 do not update the image unless BPREFRESH is enabled. A DLDREFRESH or a REGEN manually updates the BP with the current drawing changes.

DLDBPCACHE†

Enables or disables TurboDLDClassic*'s* internal cache for BP features. This cache speeds up TurboDLDClassic*'s* Big Picture functions. DLDBPCACHE is normally disabled. Performance benefits of the BP Cache 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 TurboDLDClassic*'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 locks the current BP contents into place to provide a better overall frame of reference.

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DLDBPHILIGHT†

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

DLDBPREFRSH†

This convenience feature of TurboDLDClassic, toggles the Big Picture update mode. If disabled, the BP is updated manually by issuing a DLDREFRESH command. When enabled, DLDBPREFRSH causes the BP to refresh automatically when an object is drawn or erased. The BP operations therefore are 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 puts up the BP at the position you set with DLDBPDIM. Note that the static BP disappears when other menus pop-up on the screen, and it also disappears if you draw any objects that may overwrite the BP. With these exceptions, the BP remains on-screen until you either exit the drawing screen or you type DLDBPSTATIC again.

DLDCOLOR

Invokes CustomColors™, 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 TurboDLDClassic 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 TurboDLDClassic on and off.

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

DLDECHO†

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

DLDHELP

Provides a list of TurboDLDClassic 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.

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DLDREFRESH

Refreshes the Big Picture to reflect the most current changes to a drawing. If the static BP is up, it is updated. If not, the next time the BP is brought up, it contains a current representation of your drawing, provided no changes are 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 TurboDLDClassic status. A listing of the current TurboDLDClassic parameters is 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 TurboDLDClassic version, serial number and registered user's name at the AutoCAD command line.

DLDVISREGEN†

Toggles between the Fast Regen and Visible Regen modes of TurboDLDClassic. A Fast Regen creates the display list and then display the drawing all at once. A Visible Regen displays 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 TurboDLDClassic*'s* Fast Regen mode is faster than AutoCAD's, we highly recommend its use.

Memory Usage and Lists

TurboDLDClassic shares extended memory with AutoCAD via the PharLap Virtual Memory Manager. This means that TurboDLDClassic automatically pages 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 TurboDLDClassic, 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 TurboDLDClassic 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 TurboDLDClassic. 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

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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 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 has 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. Do not display the text layer when editing the rest of the figure. This keeps 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

This section includes the topics "Upgrading From Older Panacea DLD Drivers" and "Maneuvering Through AutoCAD." These topics provide tips and tricks for using TurboDLDClassic more successfully.

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 TurboDLDClassic 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 TurboDLDClassic, you may copy the DLDCOLOR.DAT file from your older DLD's sub-directory to the sub-directory you specified during the TurboDLDClassic 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 that 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.

TurboDLDClassic and Paper Space

TurboDLDClassic features do not work in AutoCAD's Paper Space. The execution of any TurboDLDClassic command in Paper Space results in an error message at the command prompt.

Zoom Dynamic

We do not recommended using ANY TurboDLDClassic features while in the Zoom Dynamic mode of AutoCAD. Because TurboDLDClassic cannot determine when Zoom Dynamic has been initiated,

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unpredictable results occur. Use the Big Picture feature of TurboDLDClassic to accomplish the same task as Zoom Dynamic, in a much more efficient fashion.

Switching Color Modes

When switching color modes, (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 TurboDLDClassic in the middle of a drawing session using the CONFIG command is a bit like exiting and re-starting AutoCAD. If you are using the static Big Picture, re-initialize it after returning from the **Configuration** menu.

Sticky Cursors

Sometimes, when using the Big Picture, the digitizer cursor appears 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 TurboDLDClassic 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. 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: 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 saves the display position you see under a view named **All**. Then, after you have done some detailed editing and want to return to the big picture, type `VIEW Restore ALL[Enter]`, instead of `ZOOM All[Enter]` or `ZOOM Extents[Enter]`, and the full drawing is restored to the display at display list speeds, without a REGEN.

Another nuance of AutoCAD 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 are 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 TurboDLDClassic 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 TurboDLDClassic, 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 also helps to isolate the source of the problem.

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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 do not support the same graphics platforms as TurboDLDClassic and therefore are not able to accommodate mode switching back and forth.

Command Summary

This section alphabetically lists the basic commands found in TurboDLDClassic.

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 TurboDLDClassic 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 CustomColors, 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 TurboDLDClassic drawing cache on and off.
DLDDLIST	toggles the display list function of TurboDLDClassic on and off.
DLDECHO	toggles internal TurboDLDClassic command echoing at the AutoCAD command line.
DLDHELP	provides a list of TurboDLDClassic 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 TurboDLDClassic 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 TurboDLDClassic version, serial number and registered user's name at the AutoCAD command line.
DLDVISREGEN	toggles between the Fast and Visible Regen modes of TurboDLDClassic.

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CHAPTER 6. MICROSOFT WINDOWS 3.x

Topics covered in this section include Windows 3.x driver installation, reconfiguring Windows 3.x, and Display Power Manager for Windows 3.x, a mechanism to control the amount of power used by a computer's monitor.

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
- set the monitor refresh rates
- change the monitor resolution
- specify the number of available colors
- select large or normal size fonts
- configure font cache size

After new options have been selected, you can either 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.

Using Install

To run the installation program:

1. Start Windows 3.x.
2. Set Windows Display to VGA.
3. Insert the floppy labeled "Windows 3.x Display Drivers and Utilities" into your floppy disk drive.
4. From the Windows Program Manager select **Run** from the **File** menu.
5. 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.
6. Click on the **OK** button.
7. 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.

A new VGAUtil group is created in the Windows program manager. It contains the WinMode configuration utility icon. This utility can be used to set up resolutions, monitor types and other options.

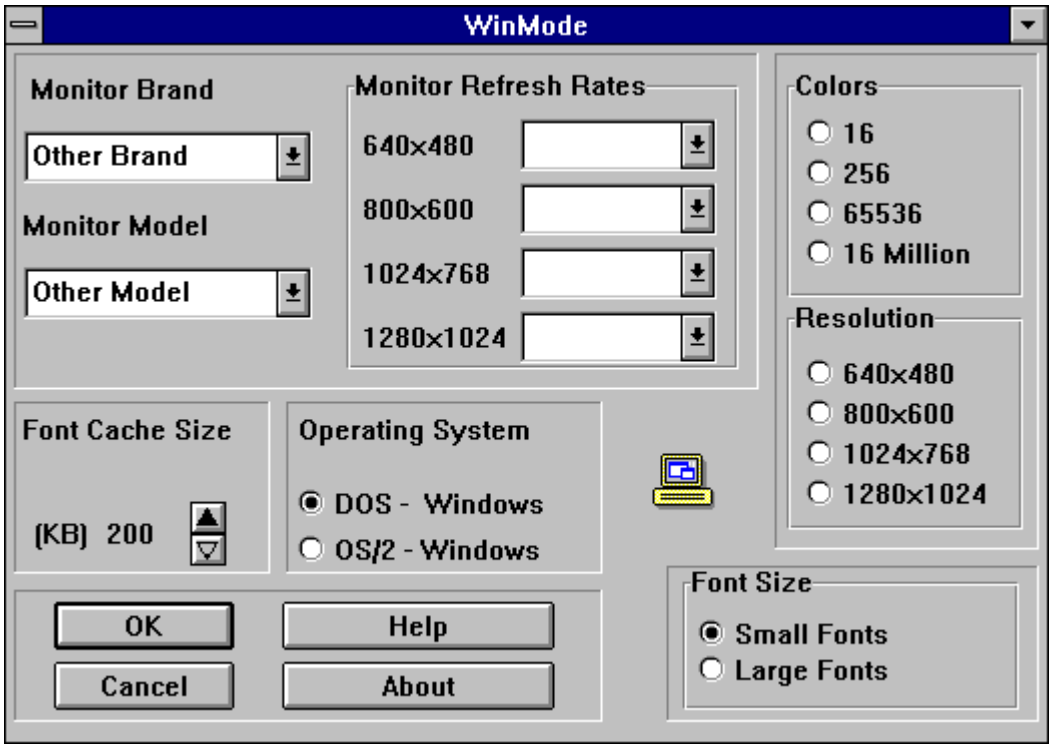
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WINMODE

The WinMode utility configures your graphics system for Windows 3.x. 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 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 the installation utility provided on the Windows 3.x Drivers and Utilities diskette.



WinMode Main Window

Using WinMode

Run WinMode by double-clicking on its icon. The icon will be in the group that you specified during the install process.

The WinMode main window contains the following buttons/menus for configuring your VGA board.

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 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

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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: Small fonts are intended for lower resolution modes. Large fonts are intended for higher resolution modes.

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.

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 there 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 can 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 and then copied to the screen. A cached character has already been created and stored and can be 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 specify the operating system under which you are running Windows.

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 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 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 is restarted immediately. Otherwise, you 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.

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POWER MANAGEMENT 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.

These four levels match the power saving modes defined by the VESA VBE/PM 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. You can specify the number of minutes each level is active. The number of minutes you specify 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.

1. Using the Windows Control Panel, select Desktop.
2. In the group Screen Saver within the Desktop dialog box, select the Screen Saver named Display Power Manager.
3. 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 the 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.

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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

- ReducedOn
- StandBy
- Suspend
- Off

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 gray, 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 US emissions of carbon dioxide - the most prevalent greenhouse gas. It also accounts for 75% and 38% of all US emissions of sulfur dioxide and nitrogen oxides respectively - the two pollutants most responsible for acid rain.

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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 EPA's power saving guidelines.

For more information on the Energy Star program contact:

Linda Latham, Manager
Energy Star Computers
US 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 7. MICROSOFT WINDOWS 95

This chapter contains information on installing and using the Windows 95 drivers included with the zPM11.

WINDOWS 95 INSTALLATION

This section describes the installation and setup instructions for Windows 95.

1. Click on the **Start** box and proceed to **Settings**, **Control Panel**. Open the **Control Panel** and select the **Display** icon or right click on your Windows 95 desktop to show the **Display Propertie**s dialog box.
2. From the **Display Properties** dialog box select the **Settings** tab and then select the **Change Display Type** button.
3. From the **Change Display Type** dialog box under the **Adapter Type** section, select the **Change** button.
4. From the **Select Device** dialog box select **Have Disk**.
5. Insert the Windows 95 Display Driver disk into floppy drive A: or B: and select the **OK** button.
6. From the **Select Device** dialog box select either the CIRRUS LOGIC PCI with VPM DirectDraw V1.00 or VLB Display Drivers. Select **OK** and then **Close** to exit the **Change Display Type** menu. Select Close again to exit the **Display Properties** folder. Select **Yes** to restart the computer before the new driver takes effect.
7. Reboot Windows 95 with the new drivers.
8. After rebooting, return to the **Display Icon/Display Properties** dialog box. You will notice that you have a new tab called **Refresh Rate**. This tab allows you to select refresh rates that are supported in your monitor.
9. Select the **Settings** tab and you should now be able to select your resolution and color depth.

HOW TO CHANGE COLOR DEPTH

1. Make sure that you have installed the Windows 95 driver.
2. Click on the **Start** box in the lower left corner and proceed to **Settings, Control Panel**.
3. Inside the **Control Panel** group, click on the **Display** icon to open the **Display properties** folder and select the **Settings** tab.
4. Click on the pull-down arrow from the **Color** palette area to select color depth.
5. Select **OK** to restart Windows 95.

HOW TO CHANGE RESOLUTION

1. Make sure that you have installed the Windows 95 driver.
2. Click on the **Start** box in the lower left corner and proceed to **Settings, Control Panel**.
3. Inside the **Control Panel** group, click on the **Display** icon to open the **Display properties** folder and select the **Settings** tab.

4. Adjust the sliding bar to either **Less** or **More** form the **Desktop** area.
5. Select **OK** and the new resolution takes effect.
6. The Change Resolution Utility will set the new resolution and ask if the display is OK. Select **Yes** if the display is OK or **No** if the display is corrupted. Or you can wait and the display will return to the previous resolution.

HOW TO CHANGE MONITOR REFRESH RATE AND DISPLAY TYPE

1. Make sure that you have installed the Windows 95 driver.
2. Click on the **Start** box in the lower left corner and proceed to **Settings, Control Panel**.
3. Inside the **Control Panel** group, click on the **Display** icon to open the **Display properties** folder and select the **Refresh** tab.
4. You can switch to different refresh rates for different resolutions and/or display types in the **Active** display area.
5. When you select a different refresh rate for your current resolution, the Refresh utility will set the new resolution and ask if the display is OK. Select **Yes** if the display is OK or **No** if the display is corrupted. Or you can wait and the display will return to the previous refresh setting.

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CHAPTER 8. MICROSOFT WINDOWS NT 4.0x

This chapter contains information on installing and using the Windows NT drivers included with the zPM11.

WINDOWS NT 4.0x INSTALLATION

This section describes the installation and setup instructions for Windows NT 4.0x.

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 4.0x Installation Disk into Drive A. Click OK.
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 appears stating that the drivers were successfully installed. Click **OK**. Another message appears stating that the driver could not be restarted dynamically. Restart Windows NT to run the new driver. Click **OK**.

SELECTING RESOLUTION AND COLOR DEPTH

1. Select **Control Panel** from the **Main** group.
2. Select the **Display** icon.
3. Select **Color Palette** to change between 16 colors, 256 colors, 65536 colors, and 16777216 colors.
4. To select desktop resolution size, go to the **Desktop** area and use the slide bar to change resolution from 640x480, 800x600, 1024x768, and 1600x1200.
5. To test the resolution, select **Test** and click OK. If the display test screen is good, select **Yes** in the **Test Mode** dialog box. If the display test screen is bad, select **No**.
6. If you selected Yes in the Test Mode dialog box, you will be prompted to restart Windows NT. Otherwise, Windows NT gives you an error message.

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APPENDIX A. SPECIFICATIONS

This appendix presents the electrical, environmental, and mechanical specifications for the zPM11.

ELECTRICAL SPECIFICATIONS

Power Requirements	Minimum	Typical	Maximum
Supply Voltage, Vcc	4.75 V	5.00 V	5.25 V
Supply Current, Vcc = 5.0 V	310 mA	640 mA	840 mA

ENVIRONMENTAL SPECIFICATIONS

Operating Temperature: 0° to +65° Celsius

Storage Temperature: -40° to +85° Celsius

Relative Humidity: < 95% at 40° Celsius, non-condensing

MECHANICAL SPECIFICATIONS

The following topics provide specifications for zPM11 dimensions and weight, connector locations, connector descriptions, and connector pinouts.

Board Dimensions and Weight

Dimensions: 5.315" x 2.008" (135 mm x 51 mm)

Height: occupies no additional slots

Weight: 1.6 oz. (45.4 g)

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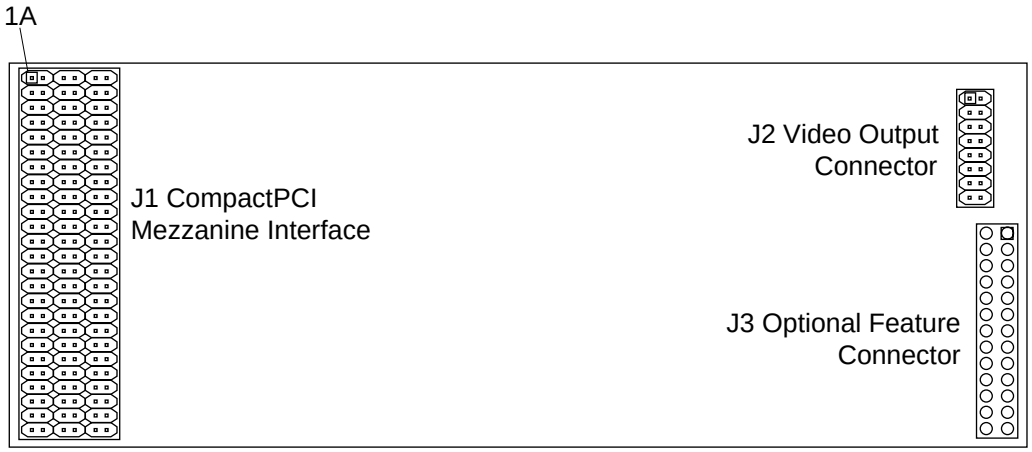
Connectors

As shown in the "zPM11 Connector Locations" illustration, the zPM11 includes 3 connectors to interface to application-specific devices. The following topics provide descriptions of the individual connectors. Connector assignments are listed below.

J1 150-pin CompactPCI Mezzanine Interface

J2 Optional 26-pin Feature Connector

J3 16-pin Video Output



zPM11 Connector Locations

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J1 (CompactPCI Mezzanine Interface)

J1 is a 150-pin 2 mm x 2 mm male connector providing the PCI local bus interface to optional mezzanine adapters designed for this application. J1 provides a complete 32-bit PCI interface. This connector is CompactPCI compatible. Refer to the CompactPCI Specification for details. See the "J1 CompactPCI Mezzanine Interface Pinout" table for pin definitions.

J1 CompactPCI Mezzanine Interface Pinout

PIN	A	B	C	D	E	F
25	5V	REQ64#	RSVD	3.3V	5V	GND
24	AD(1)	5V	V(I/O)	AD(O)	ACK64#	GND
23	3.3V	AD(4)	AD(3)	5V	AD(2)	GND
22	AD(7)	GND	3.3V	AD(6)	AD(5)	GND
21	3.3V	AD(9)	AD(8)	GND	C/BE(0)#	GND
20	AD(12)	GND	V(I/O)	AD(11)	AD(10)	GND
19	3.3V	AD(15)	AD(14)	GND	AD(13)	GND
18	SERR#	GND	3.3V	PAR	C/BE(1)#	GND
17	3.3V	SDONE	SBO#	GND	PERR#	GND
16	DEVSEL#	GND	V(1/O)	STOP#	LOCK#	GND
15	3.3V	FRAME#	IRDY#	GND	TRDY#	GND
14	CLK3	GND	REQ4#	CLK4	GNT4#	GND
13	GNT2#	CLK2	REQ3#	GND	GNT3#	GND
12	REQ1#	GND	GNT1#	CLK1	REQ2#	GND
11	AD(18)	AD(17)	AD(16)	GND	C/BE(2)#	GND
10	AD(21)	GND	3.3V	AD(20)	AD(19)	GND
9	C/BE(3)#	IDSEL	AD(23)	GND	AD(22)	GND
8	AD(26)	GND	V(I/O)	AD(25)	AD(24)	GND
7	AD(30)	AD(29)	AD(28)	GND	AD(27)	GNS
6	REQ#	GND	3.3V	CLK	AD(31)	GND
5	RSVD	RSVD	RST#	GND	GNT#	GND
4	RSVD	GND	V(I/O)	RSVD	RSVD	GND
3	INTA#	INTB#	INTC#	5V	INTD#	GND
2	TCK	5V	TMS	TDO	TDI	GND
1	5V	-12V	TRST#	+12V	5V	GND

Notes:

- V(I/O) are 5.0 V
- Rows 12 to 14 are used for slot specific signals
- Pinout is for Rev A and later boards.

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J2 (VESA Optional Feature Connector)

J2 is a 26-pin (dual 13-pin), male right angle connector with 0.1" lead spacing. Connector pinouts are shown in the "J2 VESA Optional Feature Connector Pinout" table.

J2 VESA Optional Feature Connector Pinout

Pin	Function	Pin	Function
1	GND	2	P0
3	GND	4	P1
5	GND	6	P2
7	EVIDEO*	8	P3
9	ESYNC*	10	P4
11	EDCLK*	12	P5
13	NC	14	P6
15	GND	16	P7
17	GND	18	DCLK
19	GND	20	BLANK*
21	GND	22	HYSNC
23	NC	24	VSYNC
25	NC	26	GND

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J3 (Video Output Connector)

J3 is a 16-pin (dual 8-pin), female connector with 2 mm lead spacing. VGA video signals are passed down to the CPU board through this connector. Connector pinouts are shown in the "J3 Video Output Connector Pinout" table.

J3 Video Output Connector Pinout

Pin No.	Description
1	Analog RED
2	Analog GREEN
3	Analog BLUE
4	Monitor ID 2
5	Digital Ground
6	Analog RED Ground
7	Analog GREEN Ground
8	Analog BLUE Ground
9	Vcc
10	Digital Ground
11	Monitor ID 0
12	Monitor ID 1/SDA
13	HSYNC
14	VSYNC
15	SCL
16	NC

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APPENDIX B. VIDEO MODES

The following topics summarize the video modes available on the zPM11 and give specifications for each mode.

STANDARD MODES

The zPM11 supports all standard VGA modes. These modes are listed in the "Standard VGA Modes" table.

Standard VGA Modes

Mode #	VESA Mode #	# of Colors	Char. *x* Row	Char. Cell	Pixels	Display Mode	Pixel Freq. MHz	Horiz. Freq kHz	Vert. Freq. Hz
00/01	-	16/256	40x25	9x16	360x400	Text	14	31.5	70
02/03	-	16/256	80x25	9x16	720x400	Text	28	31.5	70
04/05	-	4/256	40x25	8x8	320x200	Graphics	12.5	31.5	70
6	-	2/256	80x25	8x8	640x200	Graphics	25	31.5	70
7	-	mono	80x25	9x16	720x400	Text	28	31.5	70
0D	-	16/256	40x25	8x8	320x200	Graphics	12.5	31.5	70
0E	-	16/256	80x25	8x8	640x200	Graphics	25	31.5	70
0F	-	mono	80x25	8x14	640x350	Graphics	25	31.5	70
10	-	16/256	80x25	8x14	640x350	Graphics	25	31.5	70
11	-	2/256	80x30	8x16	640x480	Graphics	25	31.5	60
11+	-	2/256	80x30	8x16	640x480	Graphics	31.5	37.9	72
11+	-	2/256	80x30	8x16	640x480	Graphics	31.5	37.5	75
11+	-	2/256	80x30	8x16	640x480	Graphics	31.5	37.5	85
12	-	16/256	80x30	8x16	640x480	Graphics	25	31.5	60
12+	-	16/256	80x30	8x16	640x480	Graphics	31.5	37.9	72
12+	-	16/256	80x30	8x16	640x480	Graphics	31.5	37.5	75
13	-	256/256	40x25	8x8	320x200	Graphics	12.5	31.5	80

Note that the EGA-compatible text modes (which use an 8x14 font) and graphic modes 10 and F use a 16 dot high font, with the bottom two lines truncated, in the absence of the 8x14 Font TSR (TSRFONT). This creates some errors in displaying characters with descenders, but does not restrict operation of programs using these modes. In text modes using the 8x14 font, the characters "g," "j," "p," "q," "y," and "ÿ" are truncated using a middle and bottom line algorithm to avoid truncation of descenders. For compatibility with some DOS applications that use the 8x14 font, the TSRFONT utility should be used. Applications such as DOSSHELL in Graphics 25 or 34 line display modes require the TSRFONT utility to be loaded.

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EXTENDED MODES

The zPM11 supports standard VESA and extended modes. These modes are listed in the "Cirrus Logic Extended Video Modes" table.

Note: Some modes are not supported by all monitors. The best quality refresh rate for the monitor type selected will automatically be used.

VESA has recently proposed a new specification for 43 Hz interlaced, and 72 Hz timing for 1280x1024 and 1024 x 768 resolution modes. Cirrus Logic currently uses timings for these modes that differ from those proposed by VESA.

Cirrus Logic Extended Video Modes

Mode #	VESA Mode #	# of Colors	Char. *x* Row	Char. Cell	Screen Format	Display Mode	Dot Clock MHz	Horiz. Freq kHz	Vert. Freq. Hz
58, 6A	102	16/256K	100x37	8x16	800x600	Graphics	36	35.2	56
58, 6A	102	16/256K	100x37	8x16	800x600	Graphics	40	37.8	60
58, 6A	102	16/256K	100x37	8x16	800x600	Graphics	50	48.1	72
58, 6A	102	16/256K	100x37	8x16	800x600	Graphics	49.5	46.9	75
5C	103	256/256K	100x37	8x16	800x600	Graphics	36	35.2	56
5C	103	256/256K	100x37	8x16	800x600	Graphics	40	37.9	60
5C	103	256/256K	100x37	8x16	800x600	Graphics	50	48.1	72
5C	103	256/256K	100x37	8x16	800x600	Graphics	49.5	46.9	75
5C	103	256/256K	100x37	8x16	800x600	Graphics	56.2	46.9	85
5Di	104	16/256K	128x48	8x16	1024x768	Graphics	44.9	35.5	43(2)
5D	104	16/256K	128x48	8x16	1024x768	Graphics	65	48.3	60
5D	104	16/256K	128x48	8x16	1024x768	Graphics	75	56	70
5D	104	16/256K	128x48	8x16	1024x768	Graphics	77	58	72
5D	104	16/256K	128x48	8x16	1024x768	Graphics	78.7	60	75
5E	100	256/256K	80x25	8x16	640x400	Graphics	25	31.5	70
5F	101	256/256K	80x30	8x16	640x480	Graphics	25	31.5	60
5F	101	256/256K	80x30	8x16	640x480	Graphics	31.5	37.9	72
5F	101	256/256K	80x30	8x16	640x480	Graphics	31.5	37.5	75
5F	101	256/256K	80x30	8x16	640x480	Graphics	31.5	37.5	85
60i	105	256/256K	128x48	8x16	1024x768	Graphics	44.9	35.5	43(2)
60	105	256/256K	128x48	8x16	1024x768	Graphics	65	48.3	60
60	105	256/256K	128x48	8x16	1024x768	Graphics	75	56	70
60	105	256/256K	128x48	8x16	1024x768	Graphics	77	58	72
60	105	256/256K	128x48	8x16	1024x768	Graphics	78.7	60	75
60	105	256/256K	128x48	8x16	1024x768	Graphics	94.5	60	85
64	111	64K	-	-	640x480	Graphics	25	31.5	60
64	111	64K	-	-	640x480	Graphics	31.5	37.9	72
64	111	64K	-	-	640x480	Graphics	31.5	37.5	75

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Mode #	VESA Mode #	# of Colors	Char. *x* Row	Char. Cell	Screen Format	Display Mode	Dot Clock MHz	Horiz. Freq kHz	Vert. Freq. Hz
64	111	64K	-	-	640x480	Graphics	31.5	37.5	85
64	111	64K	-	-	640x480	Graphics	31.5	43.3	85
65	114	64K	-	-	800x600	Graphics	36	35.2	56
65	114	64K	-	-	800x600	Graphics	40	37.8	60
65	114	64K	-	-	800x600	Graphics	50	48.1	72
65	114	64K	-	-	800x600	Graphics	49.5	46.9	75
65	114	64K	-	-	800x600	Graphics	56.2	46.9	85
65	114	64K	-	-	800x600	Graphics	56.25	53.7	85
66	110	32K(1)	-	-	640x480	Graphics	25	31.5	60
66	110	32K(1)	-	-	640x480	Graphics	31.5	37.9	72
66	110	32K(1)	-	-	640x480	Graphics	31.5	37.5	75
66	110	32K(1)	-	-	640x480	Graphics	36	43.3	85
67	113	32K(1)	-	-	800x600	Graphics	36	35.2	56
67	113	32K(1)	-	-	800x600	Graphics	40	37.8	60
67	113	32K(1)	-	-	800x600	Graphics	50	48.1	72
67	113	32K(1)	-	-	800x600	Graphics	49.5	46.9	75
67	113	32K(1)	-	-	800x600	Graphics	56.2	46.9	85
67	113	32K(1)	-	-	800x600	Graphics	56.25	53.7	85
68i	116	32K(1)	-	-	1024x768	Graphics	44.9	35.5	43(2)
68	116	32K(1)	-	-	1024x768	Graphics	65	48.3	60
68	116	32K(1)	-	-	1024x768	Graphics	75	56	70
68	116	32K(1)	-	-	1024x768	Graphics	78.7	60	75
68	116	32K(1)	-	-	1024x768	Graphics	94.5	68.3	85
69i	119	32K(1)	-	-	1280x1024	Graphics	75	48	43(2)
69	119	32K(1)	-	-	1280x1024	Graphics	108	65	60
6Ci	106	16/256K	160x64	8x16	1280x1024	Graphics	75	48	43(2)
6Di	107	256/256K	160x64	8x16	1280x1024	Graphics	75	48	43(2)
6D	107	256/256K	160x64	8x16	1280x1024	Graphics	108	65	60
6D	107	256/256K	160x64	8x16	1280x1024	Graphics	135	80	75
71	112	16M	-	-	640x480	Graphics	25	31.5	60
71	112	16M	-	-	640x480	Graphics	31.5	37.5	75
71	112	16M	-	-	640x480	Graphics	25	31.5	85
71	112	16M	-	-	640x480	Graphics	36	43.3	85
74i	117	64K	-	-	1024x768	Graphics	44.9	35.5	43(2)
74	117	64K	-	-	1024x768	Graphics	65	48.3	60
74	117	64K	-	-	1024x768	Graphics	75	56	70
74	117	64K	-	-	1024x768	Graphics	78.7	60	75
74	117	64K	-	-	1024x768	Graphics	94.5	35.5	85
74	117	64K	-	-	1024x768	Graphics	94.5	68.3	85

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Mode #	VESA Mode #	# of Colors	Char. *x* Row	Char. Cell	Screen Format	Display Mode	Dot Clock MHz	Horiz. Freq kHz	Vert. Freq. Hz
75i(3)	11A	64K	-	-	1280x1024	Graphics	75	48	43(2)
78	115	16M	-	-	800x600	Graphics	36	35.2	56
78	115	16M	-	-	800x600	Graphics	40	37.8	60
78	115	16M	-	-	800x600	Graphics	50	48.1	72
78	115	16M	-	-	800x600	Graphics	49.5	46.9	75
78	115	16M	-	-	800x600	Graphics	56.25	53.7	85
79(3)	118	16M	-	-	1024x768	Graphics	44.9	35.5	43(2)
79(3)	118	16M	-	-	1024x768	Graphics	65	48.3	60
79(3)	118	16M	-	-	1024x768	Graphics	75	56	70
79(3)	118	16M	-	-	1024x768	Graphics	78.7	60	75
79(3)	118	16M	-	-	1024x768	Graphics	94.5	68.3	85
7B	-	256/256K	-	-	1600x1200	Graphics	135	62.5	48(2)
7C	-	256/256K	-	-	1152x864	Graphics	94.5	63.9	70
7C	-	256/256K	-	-	1152x864	Graphics	108	67.5	75
7E(3)	-	16M	-	-	1152x864	Graphics	94.5	63.9	70
7E(3)	-	16M	-	-	1152x864	Graphics	108	67.5	75

Notes:

(1) 32K direct color/256 color mixed mode.

(2) A character "i" stands for interlaced mode. 43.5 Hz or 48 Hz interlaced.

(3) These modes require 4M of display memory to support.

- Some modes are not supported by all monitors. The best quality refresh rate for the monitor type selected will automatically be used.
- VESA has recently proposed a new specification for 43 Hz interlaced, and 72 Hz timing for 1280x1024 and 1024 x 768 resolution modes. Cirrus Logic currently uses timings for these modes that differ from those proposed by VESA.

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APPENDIX C. CUSTOMER SUPPORT

This appendix offers technical assistance information for this product, and also the necessary information should you need to return a Ziatech product.

TECHNICAL/SALES ASSISTANCE

If you have a technical question, please call Ziatech's Customer Support Service at the number below, or e-mail our technical support team at *tech_support@ziatech.com*. Ziatech also maintains an FTP site located at *ftp.ziatech.com*.

If you have a sales question, please contact your local Ziatech Sales Representative or the Regional Sales Office for your area. Address, telephone and FAX numbers, and additional information is available at Ziatech's website, located at *http://www.ziatech.com*.

Corporate Headquarters

1050 Southwood Drive
San Luis Obispo, CA 93401 USA
Tel (805) 541-0488
FAX (805) 541-5088

REVISION HISTORY

Revision A - 5/97

Revision A is the first production release of the zPM11.

Revision B - 6/97

On Revision B boards, stability and performance under shock and vibration is enhanced by the use of a deeper Video Output Connector (J3).

RELIABILITY

Ziatech has taken extra care in the product design to ensure reliability. The three major ways in which reliability is achieved are:

1. The product is designed in top-down fashion, utilizing the latest in hardware and software techniques, so unwanted side effects and unclean interactions between parts of the system are eliminated.

2. Ziatech tests each board by exercising its functions, burns it in under power, and retests it to ensure that the infant mortality phase is passed before the product is shipped.

3. Ziatech maintains a lifetime data base on each board. Any negative trends in reliability are spotted and Ziatech's suppliers are informed and/or changed.

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RETURNING FOR SERVICE

Before returning any of Ziatech's products, you must phone Ziatech at (805) 541-0488 and obtain a Returned Material Authorization (RMA) number. The following information is needed to expedite the shipment of a replacement to you:

1. Your company name and address for invoice
2. Shipping address and phone number
3. Product I.D. number
4. If possible, the name of a technically qualified individual at your company familiar with the mode of failure on the board

If the unit is out of warranty, service is available at a predesignated service charge. Contact Ziatech for pricing and please supply a purchase order number for invoicing the repair.

Pack the zPM11 in **anti-static** material and ship in a sturdy cardboard box with enough packing material to adequately cushion the board. ***Any product returned to Ziatech improperly packed will immediately void the warranty for that particular product!*** Mark the RMA number clearly on the outside of the box before returning.

ZIATECH 5+5 WARRANTY

Ziatech provides a five-year limited warranty to its customers with a special extended warranty option. Ziatech also has an explicit policy regarding the use of Ziatech products in life support systems. These topics are covered in the following sections.

Five-Year Limited Warranty

Products manufactured by Ziatech Corporation are covered from the date of purchase by a five-year warranty against defects in materials, workmanship, and published specifications applicable to the date of manufacture. During the warranty period, Ziatech will repair or replace, solely at its option, defective units provided they are returned at customer expense to an authorized Ziatech repair facility. Products which have been subjected to misuse, abuse, neglect, alteration, or unauthorized repair, determined at the sole discretion of Ziatech, whether by accident or otherwise, are excluded from warranty. The warranty on fans and disk drives is limited to two years and the warranty on flat panel displays is limited to nine months from date of purchase. Other products and accessories not manufactured by Ziatech are limited to the warranty provided by the original manufacturer. Consumable items (fuses, batteries, etc.) and software are not covered by this warranty.

Ziatech Corporation warrants that for a period of ninety (90) days from the date of purchase; the media on which software is furnished will be free of defects in materials and workmanship under normal use; and the software contains the features described in the Ziatech price list. Otherwise, the software is provided "AS IS". This limited warranty extends only to Customer as the original licensee. Customer's exclusive remedy and Ziatech's entire liability under this limited warranty will be, at Ziatech's option, to repair or replace the software, or refund the license fee paid therefore.

Ziatech may offer, where applicable and available, replacement products; otherwise, repairs requiring components, assemblies, and other purchased materials may be limited by market availability.

Ziatech assumes no liability resulting from changes to government regulations affecting use of materials, equipment, safety, and methods of repair. Ziatech may, at its discretion, offer replacement products.

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THE ABOVE WARRANTY IS IN LIEU OF ANY OTHER WARRANTY, WHETHER EXPRESSED, IMPLIED, OR STATUTORY, INCLUDING, BUT NOT LIMITED TO, ANY WARRANTY FOR FITNESS OF PURPOSE, MERCHANTABILITY, OR FREEDOM FROM INFRINGEMENT OR THE LIKE, AND ANY WARRANTY OTHERWISE ARISING OUT OF ANY PROPOSAL, SPECIFICATIONS, OR SAMPLE.

Ziatech neither assumes nor authorizes any person to assume for it any other liability. The liability of Ziatech under this warranty agreement is limited to a refund of the purchase price. In no event shall Ziatech be liable for loss of profits, use, incidental, consequential, or other damage, under this agreement.

Special Extended Warranty Option

In addition to the standard five-year warranty, Ziatech offers, for a nominal fee, an extended period of warranty up to five extra years. This extended warranty period provides similar coverage and conditions as stated above in the five-year limited warranty agreement.

Life Support Policy

Ziatech products are not authorized for use as critical components in life support devices or systems without the express written approval of the president of Ziatech Corporation. As used herein:

1. Life support devices or systems are devices or systems which support or sustain life, and whose failure to perform, when properly used in accordance with instructions for use provided in the labeling, can be reasonably expected to result in a significant injury to the user.

2. A critical component is any component of a life support device or system whose failure to perform can be expected to cause the failure of the life support device or system, affect its safety, or limit its effectiveness.

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