
Orchid P9000/VLB

User's Manual



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Orchid Technology has been a leading manufacturer of hardware and peripherals for personal computers since its incorporation in 1982, and is noted for introducing new standards to the personal computer industry:

- 1982 **PCnet:** the first personal computer Local Area Network.
- 1984 **PCturbo:** the first Accelerator card for PC compatible computers.
- 1985 **ECCELL:** the first PC Multifunction card with error correction.
- 1987 **RamQuest 50/60:** the first EMS (Expanded Memory Specification) product for the IBM PS/2 computers.
- 1990 **ProDesigner II:** the first Beyond Super VGA graphics adapter to support 1024 x 768 graphics in 256 colors on interlaced and non-interlaced monitors.
- 1991 **Fahrenheit 1280°:** first to ship a Windows accelerator based on S3's 86C911 chip.
- 1992 **Fahrenheit VA:** first to ship a Windows accelerator with voice annotation built-in.

The Orchid P9000/VLB is a high-performance display adapter for 486 personal computers that supports the VESA Local Bus (VL-Bus) standard. With its dual chipset, it provides powerful graphics functions and uncompromising Windows acceleration. The Orchid P9000/VLB provides flicker-free 75Hz (non-interlaced) support, 16.8 million on-screen colors (24-bit true colors), 65,536 on-screen (16-bit high color), maximum resolution of 1280x1024x256 colors (non-interlaced), and full VESA compliance.

Thank you for purchasing the Orchid P9000/VLB. Care has been taken to ensure that it will provide you with years of trouble free operation. We believe you will be pleased with your purchase.



Before You Begin

This manual will familiarize you with the features, installation and use of the Orchid P9000/VLB. There are several symbols and conventions used throughout this manual which will help to draw your attention to a feature or to focus on important information:



When you see the Magnifying Glass it means the text is referring to something you should take a closer look at before proceeding further.

FILENAME

All MS/PC DOS filenames and DOS commands will be emphasized by this type style.

Common Names

DRAM	Dynamic Random Access Memory
PC	Refers to the family of IBM PC, PC/XT or PC/AT compatible computers
SVGA	Super VGA
VESA	Video Electronics Standard Association
VGA	Video Graphics Array
VL-Bus	VESA Local Bus
VRAM	Video Random Access Memory

INTRODUCTION

The Orchid P9000/VLB provides workstation-type graphics on 32-bit processor-based machines, and is designed to be the next generation in video graphics adapters for VESA Local Bus. The local bus design provides 32-bit data transfer between the video card and CPU, and runs synchronously with the VESA bus at speeds up to 33MHz.

Its technology features a Graphical Hardware Accelerator (GHA) for support of faster hardware-based graphics operations including, BitBlt, polygon fill, image transfers, line drawing/clipping and color expansion. The Orchid P9000/VLB utilizes both the Power 9000 processor chip for accelerated graphics and the Weitek W5286 processor chip for VGA compatibility.

Operating at refresh rates of up to 75Hz, Orchid P9000/VLB provides 16.8 million on-screen colors (24-bit true colors), maximum resolution of 1280x1024x256 colors (non-interlaced), 16-bit high color support, and full VESA compliance. The Orchid P9000/VLB maintains full compatibility with most monitor types, including interlaced and non-interlaced monitors.

It comes with a comprehensive range of software enhancements, such as graphics drivers for Microsoft Windows 3.1, AutoCAD (Protected Mode), AutoShade, 3D Studio, Lotus 1-2-3, Microsoft Word, WordPerfect, Ventura Publisher and GEM Desktop. In addition, the Orchid P9000/VLB comes standard with 3MB of surface mounted memory: 1MB of DRAM memory for 16-bit standard VGA and 2MB of VRAM memory for VESA Local Bus video.

About This Manual

This manual presumes that you are already familiar with your IBM PC compatible computer. While the Orchid P9000/VLB has been designed to be easy to install, we recommend that you refer to your computer's reference manual when terminology or installation steps are unfamiliar to you.

This manual has been organized to help you set up and install the Orchid P9000/VLB as quickly as possible. Each section is divided into short, easy to follow steps, to help you understand the installation and function of the Orchid P9000/VLB.

Section 1: Installing the Orchid P9000/VLB

Whether you are a beginner or an experienced user, this section will give you important information on the proper installation of the Orchid P9000/VLB.

Section 2: Device Drivers

Here you will be given the information needed to install high resolution device drivers for Microsoft Windows 3.1, AutoCAD (Protected Mode), AutoShade, 3D Studio, Lotus 1-2-3, Microsoft Word, WordPerfect, Ventura Publisher and GEM Desktop.

Section 3: Technical Help and Information

If you are experiencing installation difficulties or require troubleshooting information, this section will give you checkpoints to look at to ensure that your Orchid P9000/VLB is operating properly. Section 3 also includes information on the Orchid P9000/VLB technical specifications and features.

Section

1

INSTALLING THE ORCHID P9000/VLB

The Orchid P9000/VLB is designed to be easy to use and easy to install. There are three fundamental steps to the installation:

Step 1: Preparing your Computer

You will need to take the cover off your computer and prepare a VESA Local Bus (VL-Bus) expansion slot for the Orchid P9000/VLB.



STATIC!

Before handling the P9000/VLB, be sure to guard against electrostatic discharge. Do not wear clothing that causes static (such as wool sweaters). In most cases, touching the power supply housing before handling the board will discharge static electricity, or you may want to buy a Ground strap from your local computer store.

Step 2: Preparing your Orchid P9000/VLB

The Orchid P9000/VLB has one switch block that may need to be set for your system. These switches have been preset to provide optimum performance and, in most cases, will not have to be set again. However, because there are many different PC configurations, they are provided to ensure that the Orchid P9000/VLB will work properly in your system.

Step 3: Installing your Orchid P9000/VLB

Once the Orchid P9000/VLB has been securely seated in the computer and the cover replaced, the Orchid P9000/VLB will be installed and ready to operate.

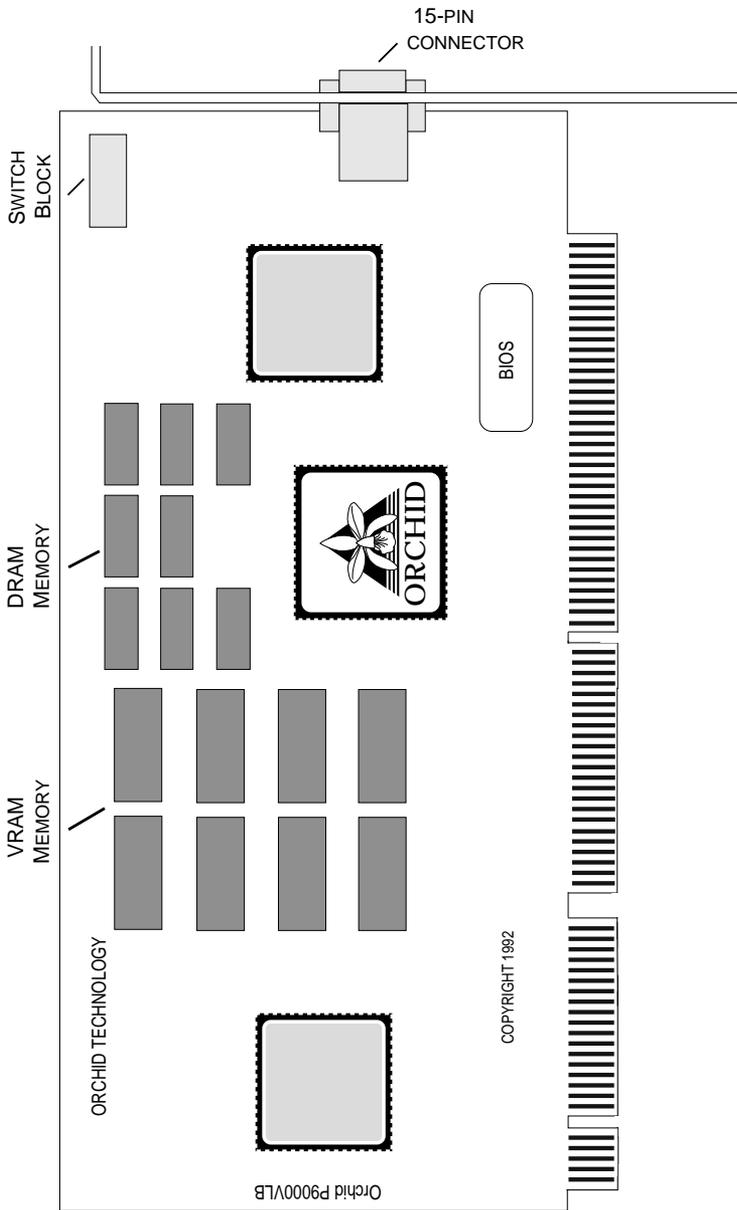


Figure 1.1: Orchid P9000/VLB

Summary of Switch Settings

The following table list the switch settings used by the Orchid P9000/VLB. For location of the switch settings, see Figure 1.1.

Location	Setting	Default	Function
Switch 1	ON OFF	✓	8-bit memory access 16-bit memory access
Switch 2	ON OFF	✓	Enable IRQ9 Interrupt Disable IRQ9 Interrupt
Switch 3	ON OFF	✓	Enable zero-wait state operation Disable zero-wait state operation
Switch 4	ON OFF	✓	Enable 16-bit access Disable 8-bit access
Switch 5	ON OFF	✓	Set to ON if Switch 1 is OFF Set to OFF if Switch 1 is ON
Switches 6 & 7	ON OFF	✓	C0000000 base address D0000000 base address E0000000 base address
Switch 8	ON		Not used

Table 1.1: Orchid P9000/VLB Switch Settings

Step 1: Preparing Your Computer

1. Make sure the power to your computer is turned off and that all of the necessary power cords and cables are disconnected from the computer.
2. Remove the screws that secure the computer chassis cover and slide the cover off (be sure to keep the screws in a safe place).
3. Make sure your system is configured for color display. (Consult your computer user's manual for more information).

Step 2: Preparing Your Orchid P9000/VLB

Switch Settings

The Orchid P9000/VLB has a small, eight position, switch block located near the mounting bracket. These switches are preset to provide the best compatibility for most computer configurations and monitor types, but you should check these switches and ensure that they are configured correctly for your computer. The following information will assist you:

Switch 1: VGA 8-bit Memory Access

ON = 8-bit Memory access

OFF = 16-bit Memory access (*default*)

If you have a monochrome video card in your system, set this switch to 8-bits (ON).

Switch 2: VGA IRQ9 Interrupt

ON = Vertical Interrupt enabled

OFF = Vertical Interrupt disabled (*default*)

If you are using an application that requires Vertical Interrupt IRQ9, set this switch to ON.

Switch 3: AT ZEROWS Signal

ON = Assert ZEROWS signal for zero-wait state operation enabled (*default*)

OFF = Assert ZEROWS signal for zero-wait state operation disabled

Switch 4: BIOS ROM Address

ON = 16-bit access (*default*)

OFF = 8-bit access

If you encounter conflicts with other peripherals using address C000:0-DFFF:F, set this switch to OFF.

If Switch 1 is set to ON, it will override this switch and all BIOS accesses will be 8-bits (see Table 1.2).

SW1	SW4	Frame Buffer	BIOS	Result
OFF	OFF	16-bits	8-bits	Use w/ cards that use C000:0-DFFF:F address
OFF	ON	16-bits	16-bits	Best performance
ON	OFF	8-bits	8-bits	Use w/ monochrome cards
ON	ON	8-bits	8-bits	Not recommended

Table 1.2: BIOS ROM Address Settings



Some motherboards use the UMC chipsets (UM82C48 & UM82C482AF). These chipsets may conflict w/ memory address C000. If so, change Switches 6 & 7 to the E000 base address, and from the "Power 9000 Installation" menu in Windows, select the E000 memory address.

Switch 5: Configure with Switch 1

ON = Set to ON if Switch 1 is OFF

OFF = Set to OFF if Switch 1 is ON

Switches 6 & 7: Power 9000 VESA Local Bus Address

ON ON = C0000000 base address (*default*)

ON OFF = D0000000 base address

OFF ON = E0000000 base address

Switch 8: Not Used

Step 3 Installing Your Orchid P9000/VLB

Once you are sure your motherboard and Orchid P9000/VLB switches are set properly, you are ready to install the Orchid P9000/VLB.

1. Locate a 32-bit VL-Bus slot for the Orchid P9000/VLB. Be sure to check if any other video adapters in your system conflict with the video memory addressing of the Orchid P9000/VLB. If so, and it is an on-board video display adapter, make sure it is disabled. If the video adapter is other than a standard MDA video adapter, remove it from the system.
2. Remove the rear slot cover bracket if it is present (keep the screw for future use).
3. Carefully hold the Orchid P9000/VLB by its top edges and lower it into a VL-Bus expansion slot. Ensure that the Orchid P9000/VLB seats firmly into the slot, and that it aligns properly with the computer's backplane.
4. Secure the Orchid P9000/VLB in place by fastening its metal bracket to the computer backplane (use the screw you removed in # 2).
5. Replace the cover of the computer along with the previously removed cables and power cords.
6. Connect your monitor cable to the 15-pin monitor connector on the Orchid P9000/VLB (see Figures 1.1 and 1.2).

Orchid P9000/VLB Installation is complete.

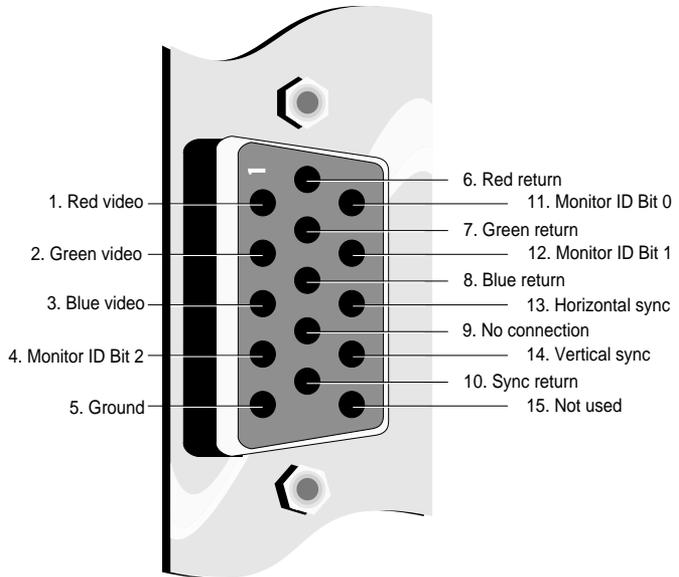


Figure 1.2: Standard 15 pin D-shell Connector

Section

2

DEVICE DRIVERS

To utilize the advanced features of the Orchid P9000/VLB, high resolution drivers for popular software applications are provided. Follow the instructions for PINSTALL.EXE for automatic driver installation.

Your Orchid P9000/VLB provides register-level VGA mode compatibility. Software programs can be operated in this mode using drivers supplied by the software manufacturer. The high resolution drivers included are the following:

Microsoft Windows 3.1	AutoShade
AutoCAD Release 11, 12	3D Studio
Lotus 1-2-3	WordPerfect
Microsoft Word	Ventura Publisher
GEM Desktop	

New drivers will be made available through the Orchid Technical Support Department, or may be downloaded from the Orchid BBS.

Before You Begin



Some software programs may already include software drivers for the Orchid P9000/VLB. Check with the manufacturer for verification.

Before installing any of the Orchid P9000/VLB high resolution drivers, verify the capabilities of your monitor. If you install drivers for a resolution that your monitor is not capable of producing, the results will probably be unsatisfactory.

The following instructions assume you are using a floppy drive designated as Drive A:, and a hard drive designated as drive C:. Please substitute the correct drive letter if your computer is configured differently.

Using PINSTALL.EXE

You must install the application software on your system before using the PINSTALL.EXE program to install the Orchid P9000/VLB software drivers.

PIINSTALL.EXE is an easy-to-use, menu driven installation program which will allow you to install Orchid P9000/VLB software drivers automatically. Insert the Orchid P9000/VLB Diskette into your A: drive and invoke the PINSTALL.EXE utility by typing:

A: \PIINSTALL 

From the Display Driver Installation Program menu, press any key, and the following menu will appear:

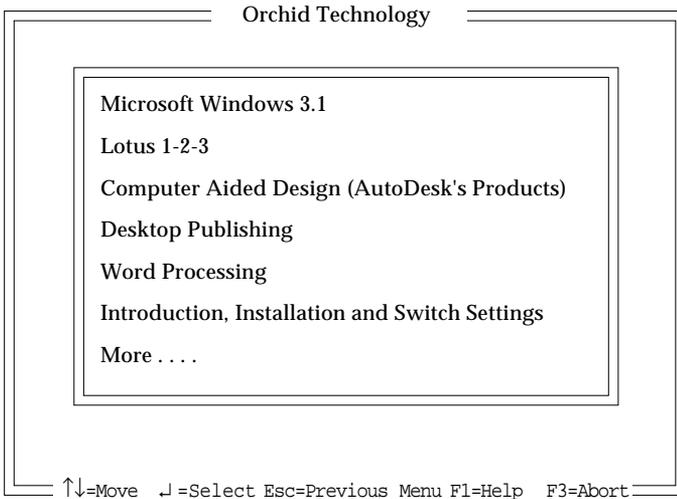


Figure 2.1: PINSTALL Main Menu Screen

From the Main Menu, highlight your selection by using the <↑ ↓> arrow keys and press <ENTER> to select.



For assistance during the installation process, *PINSTALL.EXE* provides on-line Help by selecting the F1 key at any time.

Proceed through the installation as prompted by the *PINSTALL.EXE* program. Repeat this process for all of the drivers you wish to use with the Orchid P9000/VLB.

Microsoft Windows Driver Installation

Once you select the Microsoft Windows installation, the *PINSTALL* program automatically copies the Windows 3.1 driver to your hard drive. After the driver installation is complete, exit to DOS. Follow the instructions below to configure the driver for your system configuration:

If Microsoft Windows 3.1 is installed and configured for a driver other than Microsoft's VGA driver, start at step 1, otherwise skip to step 3.

1. Change directory to your Windows directory.
2. The Windows Setup screen will be displayed by typing:

C:\SETUP

Highlight the Display option and press <ENTER>. From the menu select the VGA video display driver and press <ENTER>. Save your configuration and exit to DOS.

3. Start the Microsoft Windows application by typing:

C:\WIN

The following instructions will allow you to configure your Windows video driver by choosing your desired color, resolution and menu text fonts size.

4. From the Program Manager File menu, click on RUN and type:

C:\P9000\inst



If you changed your default directory name during installation, change the RUN command to match your drive or subdirectory.

5. If the initial screen of the installation program displays a dialog box to select whether you have 1MB or 2MB of video memory installed, click on the 2MB selection, then click OK. The menu in Figure 2.2 will appear:

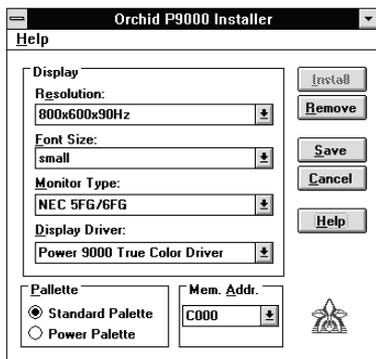


Figure 2.2: Power 9000 Installation Menu

6. Click on the INSTALL button to copy files and modify the system to use the new driver.
7. From the P9000 Installation menu, choose your desired display driver, resolution, menu text fonts size, monitor type and memory address (*default is C000*). If your specific monitor is not listed, choose the Generic monitor selection.
8. Click on the desired palette option. The Power Palette uses a proprietary high-speed color blending algorithm, and is recommended for the highest graphics performance. Select the Standard Palette if you require exact color compatibility.
9. Click on OK. Click on YES to restart Windows for all configurations and changes to take effect. When Windows reopens you will see an "Orchid Installation" window on the desktop. Inside the window will be the icon "Power 9000 Installation." Select this icon for any future changes to your Orchid P9000/VLB configurations.



If your system requires a different BIOS memory address, you have the option of selecting the D000 or E000 memory address.



To remove the Orchid P9000/VLB Windows driver from your system, you must use the Remove option on the Installation menu.

You are now ready to use the graphics capabilities of the Orchid P9000/VLB.



For more details on the Memory Address Segments of Orchid P9000/VLB, see Sections 1 and 3.

Memory Address Setting

Orchid P9000/VLB uses certain memory address segments. Some memory manager programs may try to use those address segments. If you encounter a conflict, add an exclusion statement in your CONFIG.SYS file, to exclude the Orchid P9000/VLB address segment from being used. (Refer to your software program user's manual for details on using an exclusion statement).

VESA Support

The Orchid P9000/VLB is designed to support the VESA Local Bus (VL-Bus) standard. The local bus design provides 32-bit data transfer between the video card and the CPU, resulting in incomparable video speed.

The Orchid P9000/VLB is designed to support the VESA BIOS Extension (VBE) through its BIOS. Therefore, you will not find a specific VESA driver or utility on the Orchid P9000/VLB Drivers and Utilities diskette. Extended modes can be selected through the VESA option in the application you are running. The Orchid P9000/VLB VESA BIOS supports version 1.0 of the VESA specification.

Section

3

TECHNICAL HELP

Orchid Technology is known for its responsiveness to its customers. This section will give you helpful hints for troubleshooting Orchid P9000/VLB.

Troubleshooting the Orchid P9000/VLB

The following information will help you diagnose problems you may have with the Orchid P9000/VLB.

Following these simple steps serves a two-fold purpose:

You may be able to fix your problem and avoid having to contact the Orchid Technology Technical Support Department...

or

if these steps do not help you solve your problem, they will most certainly give you a better handle on what to tell the Technical Support Analysts once you do contact them.

The information provided here is in symptom/response form. That is, a symptom is given, and a check point response is provided for you to look at.

Symptom 1

The computer does not power-up or respond when powered on. The screen is completely blank. There is no familiar boot up (POST test) beep.

Check

1. Is the Orchid P9000/VLB properly installed in the slot? Is the edge connector inserted all the way into the expansion slot? Is the Orchid P9000/VLB properly aligned with the motherboard's backplane?

2. Is there another display adapter in your system? If it is an on-board video display adapter, make sure it is disabled. If the video display adapter is other than a standard MDA video adapter, remove it from the system.
3. Is the computer set up correctly for the Orchid P9000/VLB? See Section 1 for more information on setting up your computer.
4. Are your computer and monitor plugged in? Check the power cables to your computer and monitor.

Symptom 2

The computer gives an error of 1 long beep and 2 short beeps at power up.

Check

1. Take a look at the check points for symptom 1, steps 1 through 4.

Symptom 3

The computer seems to boot up properly but there is no display.

Check

1. Is your monitor plugged in? Check the power cable to your monitor.
2. Is your monitor cable fastened securely and properly? Check both the connection at the monitor and at the Orchid P9000/VLB card.
3. Is your monitor cable the correct kind for the Orchid P9000/VLB? Check Section 1 for the proper pin out information to determine if your cable is correct.

4. Is there another display adapter in your system? If it is an on-board video display adapter, make sure it is disabled. If the video display adapter is other than a standard MDA video adapter, remove it from the system.
5. Are the switch settings correct for your Orchid P9000/VLB? See Section 1 to double check them.

Symptom 4

The display loses synchronization once it gets into a graphics program.

Check

1. Is the vertical hold on your monitor properly set?
2. Is your software properly installed for your current application? Check Section 2 for Device Driver information.
3. Is your monitor able to display the graphics mode you are using? Double check your monitor specifications to determine if you are operating in a graphics mode that your monitor simply cannot handle.

Symptom 5

The Orchid P9000/VLB works well in another brand computer, but not at all in mine.

Check

1. Take a look at the check points for symptom 1, steps 1 through 4. It is a pretty good guess that the problem lies not in the Orchid P9000/VLB if it is working properly in another system.

TECHNICAL INFORMATION

The specifications and features of the Orchid P9000/VLB are covered in this section.

Orchid P9000/VLB Technical Specifications

Configuration

Orchid P9000/VLB - 1024 KB - DRAM
2048 KB - VRAM

Computers Supported:

ISA and EISA machines: 386, 486, and compatibles (must have VL-Bus connector)

Interface Speed

Up to 33MHz

BIOS:

8-bit or 16-bit

Bus Connector:

32-bit

Card Size:

9.5" x 4.2"

Output Connectors:

15-pin D-Shell VGA

Additional Features:

Supports

75 Hz Vertical Scan Refresh Rate (*consult your monitor user's manual for the refresh rates supported*)

640 x 480 x 16.8 million colors

800 x 600 x 16.8 million colors

1024 x 768 x 65,536 colors

1280 x 1024 x 256 colors - Non-interlaced

132 Column Modes with multi-frequency or fixed frequency monitors

Memory Address Segments:

RAM: A000-BFFF

ROM: (*Refer to Section 1 - Switch Settings*)

I/O Address: 3B0-3DF (IBM standard)

Interrupt: Interrupt 9 is used to indicate vertical retrace in some VGA modes (software programmable).

Temperature:

Operating: from 0 to 40 degrees C

Storage: from -25 to 90 degrees C

Humidity:

Operating: from 15% to 90%

Storage: from 0% to 90%

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