MONSTER 3D II

USER'S GUIDE

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Diamond on the Web: www.diamondmm.de

Fast Track to Tech Support

1 ABOUT MONSTER 3D II

Monster 3D II X100 is for every PC user who wants to boost his PC with 3D graphics power for nearly all current 3D action games. Based on the Voodoo² chip set from 3Dfx, it offers reference-class 3D acceleration with excellent picture quality and highest frame rates. In supporting Direct3D™, Glide™ and OpenGL™, the most distributed gaming APIs, it guarantees maximum compatibility also for upcoming games and ensures long-lasting investment for the PC system. Satisfaction is guaranteed by easy installation (add-on design) and expandability (MegaMonster upgrade) to double the performance. Monster 3D II is simply fun, fun, fun....!

- **MONSTER 3D II FEATURES AND SPECIFICATIONS**

- **MONSTER 3D II PERFORMANCE**

MONSTER 3D II FEATURES AND SPECIFICATIONS

♦ 3Dfx Voodoo^2 chipset for outstanding speed enhancements, stunning visual effects, and crisp, clear graphical images.

   ♦ Three dedicated 3D engines on a single card, for triangle rendering and texture mapping that dramatically improve the speed and realism of game images.

      ♦ 1 x pixelfx^2 - frame buffer memory
      ♦ 2 x texelfx^2 - texture memory for 800x600 gaming with Z-buffer!

   ♦ Accelerates all Glide™ (Voodoo), Direct3D and OpenGL games for dramatic improvement in the performance of new and existing games

♦ PCI bus 2.x compliant

♦ 135 MHz DAC

♦ Analog pass through connection to standard VGA output (DDC2 support)

- Accelerated frame rates:
    - over 60 frames per second game play with one Monster 3D II
    - over 100 frames per second game play with dual cards, using the MegaMonster feature.
- Superior resolution support
    - 800 x 600 and Z-Buffer game display with one Monster 3D II
    - 1024 x 768 and Z-Buffer game display with dual Monster 3D IIs
- Advanced 3D Features
    - Hardware Triangle Set-up, Anti-Aliasing, Alpha-Blending, Gouraud Shading, Texture Mapping and more.
    - Multiple textures per pixel allow for realistic and colorful images
    - Single pass trilinear filtering for smoother, more defined visuals

- ♦ MegaMonster upgrade option:
    - ♦ Internal connector to connect 2 Monster 3D II boards for twice the performance
    - ♦ Monster 3D II and its twin use Scan Line Interleaving (SLI) to draw alternate even and odd scan lines on your screen - doubling performance and delivering unprecedented resolution and texture to PC images.
    - ♦ MegaMonster cable free available via Internet (`www.diamondmm.de`) or from European Diamond Multimedia TechSupport.

MONSTER 3D II
PERFORMANCE

(Pentium 200MHz system)

- ♦ 90 M pixels/second sustained fill rate for bilinear textures (with alpha blending, fogging and Z-buffering enabled)

- ♦ 180 M pixels/second with scan line interleaved configuration (2 Monster 3D II)

- ♦ 3 M triangles/second: filtered, MIP-mapped, Z-buffered, alpha-blended, fogged, textured triangles

- ♦ Intel Pentium II / 300 MHz processor (or better) recommended for best performance, and significantly better performance than Monster 3D.

2 HOW TO USE THE USER'S GUIDE

For your convenience, this online User's Guide has been formatted as a PDF file. This format gives you great flexibility in how you want to use this documentation. If you like, you can easily print this manual so you can access it off-line and it will look like any standard document complete with Table of Contents and page numbers.

♦ Use the zoom view tool of the reader, if some of the artwork in this User's Guide should not display properly on your screen.

♦ For printing the User's Guide, a print resolution of 600 dpi is recommended.

♦ Hypertext links are active in this manual. If you are reading this manual online, place your mouse cursor over Table of Contents entries or main headings. If a hand icon appears, simply click to move to that place in the document. Some email or World Wide Web address inside this manual may be active as well. You can go directly to your email program or Web site simply by clicking on them if a hand icon appears.

ⓘ This icon marks useful tips or important operational notes.

3 INSTALLING MONSTER 3D II

- **Installing the Hardware**
- **Installing MegaMonster**
- **Installing the Software**

INSTALLING THE HARDWARE

Important!   Monster 3D II does not replace your current video or graphics card. Monster 3D II works with your current graphics card to deliver cutting edge 3D performance.

With the power off, remove your computer cover. Find an available PCI slot and remove the bracket and screw. Remember which cables go to which connectors. You may want to label your computer's cables before disconnecting them.
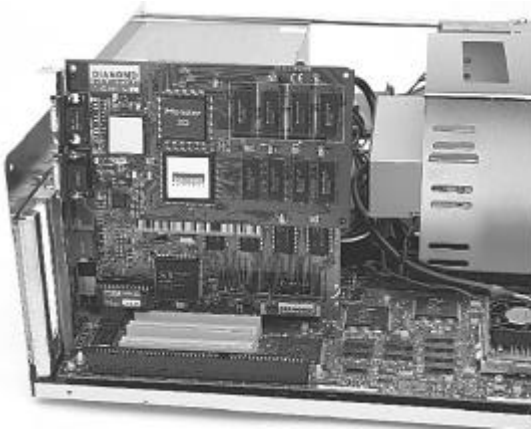
♦ Insert Monster 3D II firmly into a PCI slot. Care should be taken to press it evenly and snugly into its slot. Once you are certain Monster 3D II is installed properly in its slot, secure it with a screw.
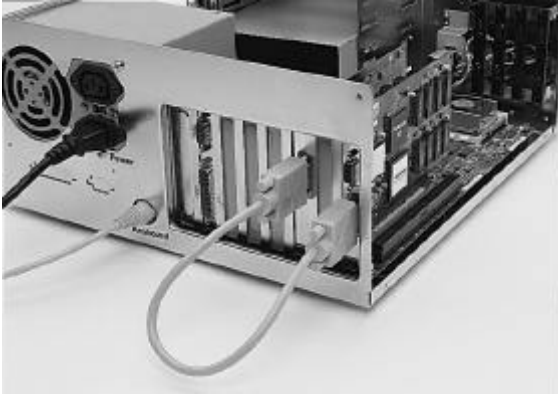
♦ Connect the lower port on Monster 3D to the monitor port on your existing graphics board with the provided VGA pass-through cable.

♦ Connect the upper port on Monster 3D to your monitor with a standard monitor cable.

- Secure your computer cover and attach any previously removed cables.

- Use Monster 3D II to blast off with the latest and greatest 3D games. Go forth and conquer!

INSTALLING MEGAMONSTER

For the MegaMonster upgrade you need 2 identical Monster 3D II cards connected with the internal MegaMonster cable.

Notes:

We recommend that you first install one Monster 3D II card and the corresponding drivers before installing the second Monster 3D II card, the MegaMonster cable, and drivers for the second card.

The MegaMonster cable is not supplied with the Monster 3D II. The cable is available free via Internet (`www.diamondmm.de`) or from the European Diamond Multimedia Customer Support.

♦ Install both Monster 3D II cards into adjacent PCI slots in your computer (see *Installing the Hardware*).

♦ Use the MegaMonster cable to connect the connectors **J3** on both Monster 3D II cards. The connectors on the cable and on the cards are keyed to ensure correct connections.

♦ Connect one of the Monster 3D II cards to your graphics card and to your monitor (see *Installing the Hardware*).

Note: You need only one VGA pass-through cable.

INSTALLING THE SOFTWARE

With the Monster 3D II hardware installed and your computer rebooted, follow the instructions below that pertain to the specific operating system that you use.

To make installing your Monster card easier and more intuitive, Diamond has provided an installation utility that will run automatically when you insert the Diamond SuperCD CD-ROM. From the SuperCD, you can learn more about Diamond and its products, install software drivers, and read on-line product manuals.

Notes:

The Diamond SuperCD will install the current Microsoft DirectX runtime and Diamond's DirectX and Glide drivers.

If you cannot start the Diamond Quick Start Utility, follow the instructions in the section *Installing Monster 3D II Drivers.*

If Windows 95 displays a "New Hardware Found" message:

♦ From the **New Hardware Found** menu, click **Cancel**.

♦ Continue with Diamond's Quick Start Utility.

Diamond's Quick Start Utility

1. Normally the Quick Start Utility starts
    automatically when you start your computer with
    the SuperCD in your CD-ROM drive.
    If it should not start automatically:
    Click on the **START** button in the task bar, select
    the option **RUN**, and then select **START.EXE**
    from the root directory of the SuperCD.

2. Choose **English** as your language for the
    installation. Then click the **START
    INSTALLATION** button and confirm your
    hardware if necessary.

3. First you will be asked the location of the
    directory where you want to install your Monster
    3D II drivers.

4. Next, you will be asked to choose **Minimal**,
    Standard, or **Custom** Installation.

    ♦   **Minimal Installation** - Monster 3D II
        Drivers.

    ♦   **Standard Installation** - Monster 3D II
        Drivers, Microsoft DirectX.

    ♦   **Custom Installation** allows you to choose
        which software components you want to
        install. If you decide you don't want to a
        install particular component, click on it again
        to de-select it.

5. Once you have made your choice, click the **Continue** button to finish installing your Monster 3D II drivers.
If Windows 95 asks you to restart your computer, choose **Yes**.

i **Notes:**

Opt for keeping the existing RICHED20.DLL and COMCTL32.DLL files, if a message prompts you for old/new versions of these files.

Games that use Direct3D or have been accelerated for 3D*fx* will automatically recognize Monster 3D II and take advantage of its awesome 3D capabilities.

Installing Monster 3D II Drivers

There are two different Windows 95 installation procedures for Monster 3D II: one for Windows 95 (version 4.00.950), and one for Windows 95 (version 4.00.950 B—referred to as OSR2). To determine which is right for you, right-click on the **My Computer** icon on the desktop and select **Properties**. You should see the exact version number in the **General** properties window. If the version number is followed by a letter B or above, choose the *Notes for Windows 95 OSR2 Users* section.

Notes for Windows 95 Users

When you first install your new Monster 3D II card in your system and boot Windows 95 for the first time, Windows 95 will inform you that it has discovered a new **Multimedia Device** and will prompt you to install drivers for it.

- ◆ Select **Driver from disk provided by hardware manufacturer** and click **OK**.

- ◆ Insert the SuperCD into your CD drive. Change the **A:** in the **Install from Disk** window to **X:\DRIVERS**, where **X** is the drive letter of your CD-ROM drive. For example, if your CD-ROM is drive **D**, you would type **D:\DRIVERS**. Click **OK**, and the driver files will be copied to their destination directories.

- ◆ When Windows 95 prompts you to restart the computer, click **Yes**.

- ◆ Once Windows 95 has finished rebooting, you will be ready to use Diamond's Quick Start utility.

Notes for Windows 95 OSR2 Users

When you first install your new Monster 3D II card in your system and boot Windows 95 for the first time, Windows 95 will inform you that it has discovered a new **Multimedia Device** and will bring up the **Update Device Driver Install Wizard**.

♦ Click **Next**. Then click **Other Locations**.

♦ Insert the SuperCD into your CD drive. Set the path in the install window to **X:\Drivers**, where **X** is the drive letter of your CD-ROM drive. For example, if your CD-ROM is drive **D**, you would type **D:\Drivers**.

♦ Click **OK**, and the driver files will be copied to their destination directories.

♦ If you are prompted for the location of DirectDraw Drivers as files are being copied, simply re-enter **X:\Drivers**.

♦ When Windows 95 prompts you to restart the computer, click **Yes**.

♦ Once Windows 95 has finished rebooting, you will be ready to use Diamond's Quick Start utility.

Notes for DOS Users

To use Monster 3D II under DOS you do not have to install any additional drivers. Games written to take advantage of specific 3D APIs or that have been specifically accelerated for the 3D*fx* Voodoo[2] chipset should function properly.

4 MONSTER 3D II DISPLAY UTILITIES

As part of its Windows 95 drivers, Monster 3D II installs an additional property page to your **Display** control panel called **Monster 3D II**.

The display utility provides options for determining how Monster 3D II displays information on your monitor while you are playing 3D games.

OPENING THE DISPLAY UTILITIES

♦ Click **Start** - **Settings** - **Control Panel** - **Display** and select the **Monster 3D II** tab.

♦ You can now make custom changes in your video display.
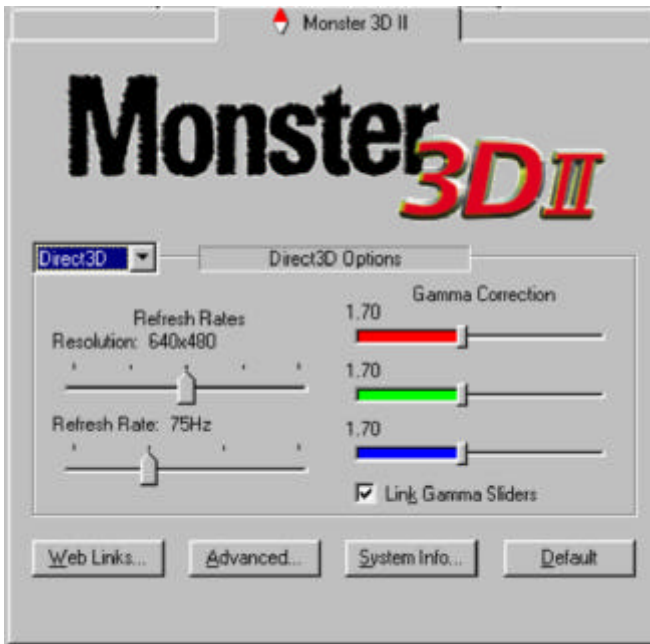
DISPLAY UTILITIES CONTROLS

API Selection

Shown as "Direct3D" above, the API selection scroll menu allows you to set display properties for **Direct3D**, **Glide**, or **Both** simultaneously. To control settings for OpenGL select the **Glide** option.

Refresh Rates

Use this control to adjust the refresh rates used by many games running on Monster 3D II. Choose a resolution from the **Resolution** slider and a refresh rate from the **Refresh Rate** slider. Click the **Apply** button to set a permanent association between the resolution and the refresh rate. You may adjust the resolution/refresh rates separately for your **Glide** and **Direct3D** based games or simultaneously for **Both**.

Note: You will only be able to select resolutions and refresh rates supported by your monitor, as reported by the Windows 95 registry. You do not need to restart your computer for the changes to take effect.

Gamma Correction

Use Gamma Correction to change the brightness levels used by 3D games. Some games may appear too dark or too bright. Each of the gamma sliders controls brightness levels for red, green, and blue as they appear in games running on Monster 3D II. Manually adjust each of the sliders, apply and test, until you achieve the brightness you want. Select the **Link Gamma Slider** checkbox to chain all three of the sliders together so that adjusting one slider adjusts them all.

Web Links

♦ This dialog offers direct links to helpful pages on Diamond's World Wide Web page.

Advanced Properties

Note: These settings are for experienced users. Selecting these options may cause problems with some games and hardware configurations.

♦ If in doubt or in case of problems click the **Default** button to return to the factory-default settings.

♦ To display more information on the **Advanced Properties** settings, click the **?** symbol and move the cursor to the topic where you want more details.

Don't Sync Buffer Swaps to Monitor Refresh Rate

When selected, Direct3D or Glide applications will not synchronize buffer swaps with the vertical retrace signal of the monitor. Rendering performance may increase when this option is selected; however, visual tearing may occur.

Disable Voodoo2 Direct3D Support

When selected, Monster 3D II will not be available as a Direct3D Device.

Force Trilinear Texture Filtering

When selected, Direct3D apps which use texture mipmapping will always perform trilinear texture filtering. Selecting this option will not impact rendering performance.

Force Advanced Texture Filtering

When selected, Glide apps will utilize an advanced texture filtering mode. The visual quality of the rendered scene may be improved when this option is selected; however a rendering performance decrease may occur.

Limit Texture Memory

When selected, Glide apps will limit the use of texture memory to 2 MBytes for each texture mapping unit. Some Glide games may not work correctly if this option is not selected.

Enable SLI Auto-detection (Two Boards)

When selected, Direct3D or Glide will auto-detect SLI (Scan-Line Interleaving) boards. Disabling this may help some games run properly.

Performance

The Performance slider allows cutting edge users the ability to increase their Monster 3D II performance.

Note: Performance increases may not be seen in all games. Also, some systems may experience compatibility problems when run at maximum performance.

System Info

The System Information dialog provides hardware and software profiles for Monster 3D II.

ⓘ Note: This information also is helpful and required if you want/need to contact the TechSupport.

The **Monster 3D II Hardware Profile** section displays some card-specific hardware information:

Scan-line Interleave	Indicates that two Monster 3D II boards are installed and operating in Scan-line Interleave mode. This mode is disabled if the **Enable SLI auto-detection** checkbox in the **Advanced** dialog is unchecked.
FBI Revision	This is the revision number of the frame buffer interface chip.
Frame Buffer Memory	Indicates the total amount of memory available for the frame buffer. The value impacts the maximum resolution available.
Texture Mapping Units	Number of Texture Mapping Units (TMUs) on the card. Two are needed to accelerate multi-textured applications fully.
TMU Revision	This is the revision number of the Texture Mapping Units.
Total Texture Memory	The sum of each TMU's memory.

The **Monster 3D II Software Profile** section shows the version numbers of the Monster 3D II drivers. Use the version number to help determine if you have current drivers.

FxMemMap VxD Version	This is the version number of the FXMEMMAP.VXD file currently in use.
WinGlide 2.x Driver Version	This is the version number of the GLIDE2X.DLL file currently in use.
Direct3D Driver Version	This is the version number of the MNSTR2.DRV file currently in use.
Direct3D 32-bit DLL Version	This is the version number of the MNSTR232.DLL file currently in use.
Direct3D 16-bit DLL Version	This is the version number of the MNSTR216.DLL file currently in use.

5 REMOVING MONSTER 3D II

To remove the Monster 3D II, be sure to do at least the following:

1. Shut your computer down and disconnect the power cable from the electrical outlet.

2. Remove the computer case as outlined in the hardware installation instructions in Chapter 3.

3. Ground yourself by touching the power supply box.

4. Now, simply reverse the hardware installation procedures from Chapter 3 and connect the VGA cable to your regular graphics card.

Note: The Monster 3D II software drivers may remain on your system with no negative effect after you have removed the hardware.

A MONSTER 3D II TROUBLESHOOTING

Windows 95

If you experience a problem using Monster 3D II under Windows 95, there are three possible causes of your problem:

♦ Your game is incompatible with Monster 3D II or the 3D*fx* chipset.

♦ Monster 3D II is not properly installed.

♦ Monster 3D II drivers are not correctly installed.

DOS

If you are experiencing problems using Monster 3D under DOS, there are two possible causes of your problem:

♦ Your game is incompatible with Monster 3D II or the 3D*fx* chipset.

♦ Monster 3D II is not properly installed.

FAQs

Frequently **A**sked **Q**uestions and their answers may be found at the `Diamond Multimedia Web` site.

Your game is incompatible with Monster 3D II or the 3D*fx* chipset

Monster 3D supports the following 3D APIs

Windows 95

- ♦ Microsoft Direct3D
- ♦ 3D*fx* WinGlide
- ♦ OpenGL (games subset)

DOS

- ♦ 3D*fx* Glide

If the game you are playing does not support one or more of these 3D API's, your game will not be able to recognize Monster 3D II, and hence will not take advantage of it. Check with the game publisher in question about obtaining a version that will support any of the above API's.

If you experience problems with a game that was developed for an older 3D API version (for example, DirectX version lower than DirectX 5.0), check with the game publisher in question about obtaining an updated version of the game.

MONSTER 3D II IS NOT PROPERLY INSTALLED

Check to make sure that Monster 3D II is properly seated in its PCI slot and that the pass-through cable is firmly and correctly connected to your graphics card. For more information, please see *Installing Monster 3D II.*

MONSTER 3D II DRIVERS ARE NOT CORRECTLY INSTALLED

- ♦ Click **Start** - **Settings** - **Control Panel** - **Display** and select the **Monster 3D II** tab.

- ♦ Some **Advanced** settings may cause problems with some games and hardware configurations. Set the **Advanced Properties** to **Default.**

- ♦ Click the **System Info** button to find out which drivers and which driver versions you have installed.

- ♦ Use the **Web Links** button and find the latest drivers and additional instructions for Monster 3D II on Diamond's Internet home page.

- ♦ Consider to re-install the Monster 3D II drivers as described in *Installing Software.*

STEALTH 64 VIDEO GT DRIVERS

The S3 968/868 video controller which is used, for example, in Diamond's Stealth64 Video 3000 series of video cards, among others, contains a memory bug.

If this bug causes problems with the Monster 3D II card in your system when running Diamond GT drivers, you can fix it with the utility **`FXREMAP.EXE`** on the SuperCD in **`\INSTALL\DIGVIDEO\MON3D_2\TOOLS\`**. The file **`README.TXT`** in this directory provides more information.

Note: This utility is available on the Internet as **`S3FIX`**.

DISPLAY MODES

Resolution	Colors	Refresh Rates (Hz)
640 x 480	65k	60, 72, 75, 85, 120
800 x 600	65k	60, 72, 75, 85
1024 x 768	65k	60, 72, 75, 85,

Notes:
Z-buffer support up to 800 x 600
Z-buffer support for 1024 x 768 only
in two-card configuration (SLI)
Colors are 24-bit dithered to 16-bit RGB (65k colors)

B   CONTACTING DIAMOND

Diamond on the Web: www.diamondmm.de

Fast Track to Tech Support

C GLOSSARY

Table of Contents

3D
Three-dimensional

3D-DDI
3D device driver interface, software interface (3D-API) from Microsoft, higher level 3D-APIs like OpenGL and 3DR may be implemented in Windows 95

3DR
3D software interface (3D-API) from Intel, supporting Microsoft's GDI DDI, DCI and 3D-DDI

ADI
AutoDesk Device Interface

Alpha blending
Creating transparent materials with the help of additional information for each pixel.

Analog
Continuously varying electronic signal to reproduce information. Compare digital.

Analog Display
Monitor that uses variable color control voltages to display a very large number of colors but requires very few inputs.

ANSI
American National Standards Institute.

Anti-aliasing
Interpolating the colors of neighboring pixels in order to avoid the 'pixel look' of an image.

API - Application Programmers Interface

An API is a series of software commands used by programmers to implement a specific set of instructions, such as the creation of 3D graphics, and make those instructions available to other programs, or to make specific functions of your operating system, such as Direct3D, available to an application.

Artifacts

Blurred or "blocky" portions of degraded image quality in a digital video.

ASCII

American Standards Committee on Information Interchange. A standard used by IBM and compatible computers to represent numbers and characters in binary form.

Bandwidth

Required capacity for the data volume and transmission rate.

BIOS

Stands for Basic Input-Output System. Code in your computer's ROM (Read Only Memory) that provides the power-on self test and other operating functions.

Bits per pixel

Number of bits used to represent the color information of a pixel.

Blitter

Fast memory transfer in the graphics board without using the CPU, e.g. used for moving parts of the invisible screen.

BMP (Windows Bitmap)

This format enables Microsoft Windows to display images on devices with similar capabilities in a consistent way. Save pictures in this format if you wish to continue to process them later under Windows.

BNC connector

Standardized connector with a bayonet socket, used for connecting a graphics board to a monitor with separate R(ed), G(reen) and B(lue) inputs.

Booting/Booting Up
Starting the computer. There are two types. Warm booting is accomplished by simultaneously pressing the CTRL/ALT/DEL keys and can occur only when the computer is running. A cold boot requires activation of the ON/OFF switch.

Brightness
Brightness of an image is determined by the amount of light emitted by it. No light (black) therefore means 'no brightness', whereas pure white light means 'maximum brightness'.

Burst mode
Fastest data transfer mode in which a large burst of pure data is transferred in one block.

Bus master
PCI bus slots must have bus master capability. This means PCI extension boards may move data very fast via the PCI bus without using the CPU (similar to Direct Memory Access).

Bus system
System of parallel data lines to transfer information between individual system components, especially to expansion boards (e.g. PCI bus).

CGA
IBM Color Graphics Adapter, one of the first color graphics standards. Either 320x200 pixels with four colors or 640x200 pixels with two colors can be displayed.

Chrominance
Portion of a video signal which corresponds to color values and includes information about hue and saturation. This color component essentially complements the brightness or luminance component of a color video picture.

Clipping
Limiting the drawing area to any rectangular area by cutting its edges.

Color Display
Type of monitor capable of displaying information in color. It is often called an RGB (red, green, blue) monitor, referring to the signals needed to drive it.

Contrast

The contrast of an image is the difference between light and dark. A contrast-intensive image is one in which contains strong transitions from light to dark. A contrast-weak image contains transitions that are hardly noticeable.

CPU

Central Processing Unit, which is the main processor chip of a computer, e.g. Pentium.

D/A converter (DAC)

Converts digital input signal to analog output signal, e.g. image data in the display memory of the graphics board is converted to video signal for the monitor to display.

DDC (Display Data Channel)

The VESA Display Data Channel provides a serial data channel between the monitor and the graphics card - if both, monitor and graphics card support DDC and the monitor data cable includes the additional DDC wire. DDC support automatically transfers monitor data (e.g. type, name, max. horizontal frequency, timing definitions) to the graphics card. The graphics card may also send instruction to the monitor via the DDC line.
There are different DDC standards: DDC1, DDC2B, and DDC2AB.

Default Mode

Capabilities, resolutions and display mode the system operates with when you start your computer.

Delta frame

Frame containing only the data that has actually changed since the last frame. Delta frames are an efficient means of compressing image data. Compare key frame.

Digital

(1) Method of representing sound or other waves as a series of binary numbers. (2) Tuning method for radios in which the desired freq. is set by digital calculation. (3) Numeric display of information. Compare analog.

Digital Display

Also called TTL. A type of monitor that switches signals ON or OFF to determine display color. Types of digital displays include the IBM Enhanced Color Display or Monochrome Display.

Digitize

Process of turning an analog signal into digital data.

Digitizer

Input device in the CAD area, used for scanning printed graphics or drawings, i.e. converting them to digital computer graphics.

Direct3D

3D software interface (3D-API) from Microsoft for Windows 95 and Windows NT. Uses DirectDraw.

DirectColor

Generic term for TrueColor, RealColor and HiColor. Color information is passed directly to the D/A converter instead of being translated by a look-up table. Therefore full color information must be saved for each pixel.

DirectX

Interactive media technologies for Windows 95 and Windows NT. Allows the development of high-performance interactive applications by extending to the developers the full performance of the underlying hardware. Includes the DirectDraw, Direct3D, DirectSound, DirectInput, and DirectPlay APIs.

Dither

Process of representing a color by mixing dots of closely related colors.

DMA

Direct memory access, a method of data transfer where information is transferred directly between system components without the help of the CPU.

Double buffering

Also called page flipping. The display buffer has double size. The next image can be drawn in the part of the display buffer which is invisible at first. When it is ready, this part will be displayed, and in the other part the next image will be prepared. With this technique animations and games look more realistic than with a simple single buffer.

DPMS

Display Power Management Signaling; VESA standard which allows energy saving operation of monitors.

DRAM

Dynamic Random Access Memory, memory for read and write operations which is non-permanent.

Driver

Part of a software program that interacts with a particular piece of equipment in your computer system (i.e. video boards, printers, and keyboards). Drivers are often loaded by your config.sys at system boot.

EEPROM

Electrically erasable programmable read only memory; used like a ROM permanent memory chip, but can be programmed and erased to replace DIP switches and jumpers on new graphics boards.

EGA

IBM Enhanced Graphics Adapter, which allows 640 x 350 pixels with 16 colors.

Enhanced Color Display (ECD)

IBM Enhanced Color Display capable of 640 x 350 resolution.

Expansion Board

Device used to expand a computer's capability.

Expansion Slot

Electrical connection within the computer used for the addition of Expansion Boards.

Feature connector

Also called VGA output connector. 26-pin connector for connecting expansion boards to a graphics board using a flat cable.

Filter

Special effect applied to a video clip or image to alter its appearance. Filters can also correct problems involving color balance or brightness and contrast.

Fixed Frequency Monitor

Analog monitor which can only sync to a very narrow range of scan frequencies at certain resolutions and refresh rates.

Fog

Fading effect that depends on an object's distance from the viewer.

Fps

Frames per second. Measurement unit for the frame rate.

Frame

Single video image.

Frame Rate

Number of images shown per time unit. Software videos have a fixed frame rate. When playing back the actual frame rate achieved can differ to the rate defined in the video considerably.

Frame size

Width and height of a frame expressed in pixels.

Frequency

Number of samples per second in a sound or video file. The higher the frequency, the better the quality of the sound or video.

Glide ™

Specialized gaming API developed by 3Dfx

GLINT

3D processor from 3Dlabs.

Graphics accelerator

Device the purpose of which is to increase speed in performance-demanding graphical environments.

Grayscales

Grayscale image consists of different shades of gray (like a black-and-white photograph). This normally means that 254 different grayscales plus black and white (= 256) are used.

H-Sync
length of the horizontal synchronization pulse for a monitor, given in microseconds

Hardware Triangle Setup
3D pictures are computed of small triangles for a better 3D look. These triangles are either generated by software via the CPU or by hardware acceleration for faster rendering.

Heidi
AutoDesk's Heidi Development Kit helps developing graphics intensive software, especially the drawing and display portion of the programming, such as render, pan, zoom, etc.

Hercules Graphics Card (HGC)
Video adapter that provides bit mapped single color graphics.

Hexadecimal Notation
A base-16 numbering system that uses numbers and letters. The hexadecimal sequence begins: 1 2 3 4 5 6 7 8 9 A B C D E F, then 10, 11 etc.

HiColor
Designates 15 bits per pixel or 16 bpp graphics mode, i.e. 32,768 or 65,536.

Hoops
3D software interface (3D-API) from Ihaca Software.

Horizontal Frequency
Rate at which a monitor displays each scan line, usually measured in kilohertz (kHz). The value must be set depending on the operating limits of the monitor in order not to damage it.

Hue
Synonym for color.

I/O Port
Input/Output port. An address used to access a hardware device.

Indexed 16 and 256 Color Images
Indexed color images contain a color table in the file. This table lists all the colors that could be used in the file. An indexed 16-colour image contains a table with 16 color entries (4 bits) whereas for an indexed 256 color image 256 colors are listed (8 bits).

Other colors can be simulated in a way similar to using grayscales in a black-and-white image, by simply positioning the pixels in varying densities. The eye then sees color mixtures that are not actually in the color table.

You can transform images into indexed color images in order to load them into programs such as Windows Paintbrush, or just to see them on monitors that can only display 256 or 16 colors.

Interlaced Display
Monitor that refreshes every other scan line (odd or even) every other pass of the screen. Thus higher graphics resolution is possible, but more flickering occurs than with non-interlaced monitors which refresh the entire screen (every scan line) every pass of the screen.

Interrupt Request (IRQ)
Signal used by a device, such as a mouse, to inform the CPU that it is present and functioning and to trigger certain procedures.

Jumper
Small plastic plug that fits over a pair of pins. When the plug straddles two pins it makes an electrical connection. The computer makes decisions based on whether the connection is made or not. A group of jumper pins is called a jumper block.

Kbps
Kilobits per second, a quantity for measuring transmission speeds.

Line Drawing
This is a hardware function of the graphics processor chip. Only the starting and ending coordinates of a line are supplied by the CPU. The rest of the work drawing the line is then done by the graphics processor.

Luminance
Portion of a video signal corresponding to brightness value - essentially the black-and-white foundation of a color video picture.

MDA
IBM Monochrome Display Adapter.

Monochrome Display
Monitor that displays information in one color only; sometimes called a black & white display.

Morphing
Special effect in which one shape is gradually transformed into another.

Multi-frequency Monitor
Type of monitor that supports a wide range of horizontal scanning frequencies and vertical refresh frequencies. This type of monitor accepts inputs from many different video display adapters.

OpenGL™
3D software interface (3D API) for Windows NT and Windows 95, licensed from Microsoft and based on Iris GL from Silicon Graphics. The OpenGL gaming sub-set is part of the OpenGL instructions. Monster 3D II is not able to run professional CAD/CAM applications, but works with 3D games supporting this OpenGL sub-set.

Palette

Selection of colors from which to choose. Your board provides as many as 16.7 million simultaneous colors from a palette of 16.7 million. This capability is sometimes referred to as TrueColor. It is believed that the human eye can discern no more than 16.7 million colors.

PCI bus

Peripheral Component Interconnect bus; system of parallel data lines to transfer information between individual system components, especially to expansion boards.

Peripheral Equipment

Auxiliary equipment connected to a computer (e.g. monitor, printer, keyboard, etc.).

Pixel

Short for picture element; the smallest field displayed on the monitor; could be compared to the dots which form images in photos printed in newspapers. Also called pel.

Pixel clock

Also called pixel frequency. Number of pixels drawn per second in MHz (million pixels per second). The values are either fixed or freely programmable.

Pixel depth

Also called color depth. Number of bits of color information per pixel. A system using eight bits per pixel can display 256 colors. A system using 16 bits per pixel can display 65,536 colors. A system using 24 bits per pixel can display over 16.7 million colors. Twenty-four-bit color is often called true color because the human eye can distinguish among approximately six million different colors, or fewer than are available in a 24-bit color system. 24 bits means 8 bit for each RGB. With 32 bit pixel depth 8 bits are used in addition for an Alpha Channel.

Polygon Fill

Special hardware (chip) routine used to fill polygons with pixel information.

Primary Display
Monitor which is active when you power on your system.

PS/2 Display Adapter
IBM VGA board for Industry Standard Architecture (AT bus) computers.

RAM
Random Access Memory; memory that can be read from and written to.

RealColor
Normally designates a 15 bits per pixel or 16 bpp graphics mode, i.e. 32,768 or 65,536 colors.

Refresh rate
Vertical refresh rate in Hz indicates how many full images per second are displayed on the monitor. The higher the refresh rate, the less the display will flicker.

Rendering
Process of displaying an object with shading effects to yield a more natural three-dimensional appearance.

Resolution
Number of pixels displayed in horizontal and vertical direction on the monitor. The higher the resolution, the crisper and sharper the images appear.

RGB 8Color
RGB8 color file types are 3 bit types in which each pixel can have one of 8 colors. The RGB8 color images are automatically transformed into indexed 16 color images whereby the 8 colors are retained but space for further 8 colors is created. It is not possible to transform an existing file into an RGB8 color file type.

RGB Color Model
Monitors use additive mixing of the three basic colors red, green and blue to create images on the screen with an infinite number of colors. Image data is therefore processed via data for RGB color combinations. The combinations of the three basic colors create a color model whose origin is the color black and the opposite value is the color white.

RGB True Color

RGB stands for red - green - blue. All the colors that are used in this file are created additively mixing parts of the three basic colors. The parts of the three basic colors can be varied in 256 steps. If you mix all these colors together a total of 16.7 million possible color combinations is attainable (3x8 bits = 24 bits, 2 to the power of 24 = 16.7 million). As the human eye can not tell the differences between color hues from about this level, such an image is termed 'True Color', i.e. 'as in real life'.

ROM

Read Only Memory; memory space in your computer for storing permanent operating instructions. It cannot be written to.

Saturation

Amount of gray in a color determining the intensity and purity of a color. A color with a high saturation value is optically very intensive. A color with a low saturation value appears weak (i.e. with less color content).

Scaling

Transformation of image data to different sizes.

Scan Line Interleave (SLI)

Two Monster 3D II process in parallel - one card computing the odd lines and the other card computing the even lines of the screen picture - thus doubling the display performance.

Shading (flat, Gouraud)

Shading or rendering is a way to define the colors on curved surfaces in order to give an object a natural appearance. To achieve this, the surfaces are subdivided into many small triangles. The three most important 3-D shading methods differ in the algorithm used to apply to these triangles:

- Flat shading: In this simplest method each triangle gets one single color, resulting in a faceted appearance of the surface.

- Gouraud shading: The color shades on a triangle are calculated by interpolating the vertex colors, resulting in a smooth appearance of the surface.

Shading (Phong)
- Phong shading: The color shades on a triangle are calculated by interpolating the vertex colors, additionally regarding the normal vector at each triangle (i.e. its orientation in space).

Single screen
DOS screen and high-resolution graphics screen appear on the same monitor.

Stencil
Special information for each pixel, whether and how it is drawn and redrawn.

Sync
Stable condition which exists when two repetitive events maintain a constant time relationship; your monitor is in sync with the signals from your board when the display is correct and stable.

Texture mapping
Wrapping a bitmap around an object, including perspective correction, for example a wallpaper on a wall or a wood texture on furniture. A video can also be used as texture map.

TrueColor
Ability to display 16.7 million simultaneous colors (24 or 32 bits per pixel). Color information saved in display memory is not translated by look-up table, but passed directly to the D/A converter. Thus full color information must be saved for each pixel. It is believed that the human eye can discern no more than 16.7 million colors. See 'palette'.

V-Sync
Length of the vertical synchronization pulse for a monitor, given in microseconds.

Variable Frequency Display (VFD)
Monitor that is capable of displaying a wide range of resolutions through it's ability to sync to a wide range of horizontal and vertical scan frequencies.

Vertical Frequency
Rate at which the monitor screen is refreshed. Usually measured in hertz (Hz).

VESA
Video Electronics Standard Association; consortium for the standardization of computer graphics.

VGA
IBM Video Graphics Adapter with a standard resolution of 640 x 480 with 16 colors.

VRAM
Video Random Access Memory; memory chip for fast graphics boards.

YUV Color Palette
The image information of individual frames is comprised of a brightness part and 2 color parts. The color part is calculated by evaluating the difference to the brightness value. This method was first utilized in television technology.

Z-Buffer
3-D depth information (position in the third dimension) for each pixel.

Zooming
Increased display of an image section.

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Diamond Monster 3D II Warranty

Your Monster 3D II comes with a five-year hardware warranty. Diamond warrants this Monster 3D II against defects in material and workmanship for a period of five years from the date of purchase from Diamond or an authorized Diamond agent. This warranty does not cover any incompatibilities due to the user's computer, hardware, software or any other related system configuration in which the Monster 3D II interfaces.
To ensure your warranty, it is necessary that you keep the invoice for the Monster 3D II. If your Monster 3D II card is damaged, contact your local retailer first.
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E   CE AND FCC INFORMATION

This device complies to CE Certification pursuant EN55022:1994-08/A1:1995-05 class B

This device has been tested to comply with the FCC standards for home or office use.
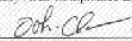
Operation is subject to the following two conditions:
(1) this device may not cause harmful interference, and
(2) this device must accept any interference received, including interference that may cause undesired operation.

Declaration of Conformity

DECLARATION OF CONFORMITY

This device is in conformance with Part 15 of the FCC Rules and Regulations for Information Technology Equipment. Operation of this product is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Trade Name:	Diamond Multimedia Systems, Inc.
Model:	MONSTER 3D II (22150105-004)
Address:	2880 Junction Ave.
	San Jose, CA 95134-1922
Contact Person/Title:	Kevin Flory/Vice President of Engineering
Telephone:	408-325-7000
Fax:	408-325-7437

EUT Certification Summary

Equipment Class:	FCC Class B, ITE
Product Type:	3D Graphics Card - Subassembly
Report Number:	R9802131
Date of Issuance:	February 13, 1998
Bus:	30MHz
Chipset:	3Dfx VooDoo2
Tested by:	Bay Area Compliance Laboratory Corp.
Authorized Signature:	John Y. Chan – Compliance Engineering

We, the responsible party:

Diamond Multimedia Systems, Inc.

declare that the product

Monster 3D II (22150105-004)

was tested to conform to the applicable FCC Rules and regulations. The method of testing was in accordance to the most accurate measurement standards possible, and that all necessary steps have been in forced to assure that all production units of the same equipment will continue to comply with the Federal Communications Commission's requirements.

Signature _____   Date 3/9/98

Kevin Flory _____   Vice President of Engineering _____
Name   Title