FIRE GL 2000
FIRE GL 3000

High-Performance 3D CAD Graphics Board

User Manual

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This device complies with CE Certification pursuant to EN55002 IEC 801-2, 1991. This device also complies with Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in residential installation. This device generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation.

Installing the Software from Diskettes

You have received the software on CD. It is also possible that your package also includes 3.5" diskettes. This manual describes the installation from the CD as this is the most common method. If you intend to install from the diskettes, please take note of the README files on these disks and the starting instructions on the diskette labels.

Important Note
It is **imperative** that you read the README file on the CD and all the documentation supplied with your graphics board before installing it! If you fail to do so DIAMOND Multimedia cannot accept any responsibility for claims that may be caused as a consequence.
To see the README file, put the CD in your drive and change to the
...\INSTALL\GRAPHIC\FIRE2000 [or \FIRE3000, resp.] \INSTALL\ directory. Then run:
WSHOW README.ENG

Table of Contents

General Information

Symbols and Conventions

The following symbols and syntax conventions are used in this manual:

Warning:	This section contains a warning or important information.

Note:	This section contains useful hints.

DOS commands are written in capital letters, example:
E:
DIAMOND.EXE
If not defined in another way, all DOS commands must be confirmed with the ENTER or RETURN key.
Example: Examples e.g. for commands are indicated by this format.
Screen messages are shown in `Courier`.
Cross references to other parts of the manual are shown in *italics*.
Directory names mentioned in this manual are for example and written in capital letters.
This document refers to your CD drive as E:. Please enter the relevant letter for your system.

Delivery Scope Checklist

Your package should contain the following items:

- Graphics board
- VGA loop cable; 8-pin mini-DIN to 15-pin VGA male
- Software installation CD
- Documentation

Warranty

You have a 5-year warranty for your DIAMOND Multimedia graphics card. To ensure your warranty, it is necessary that you keep the invoice for the graphics card. If your graphics card is damaged, contact your local retailer first.
Your board is a complex electronic device and can only be repaired by authorized technical personnel with the required equipment. Do **not** attempt to change or repair any parts of this product. Doing so will render your warranty invalid.

Support

The following support services are available:

- Technical support (telephone, ExpertLine)
- Free software updates via BBS, Internet, or CompuServe
- Fax-back system

Further information concerning these support services can be found in the *'If You Need Help'* section at the end of this manual.

FCC Notice

This device complies with Part 15 of the FCC Rules.
Operation is subject to the following two conditions:

(1) this device may not cause harmful interference, and

(2) this device must accept any interference received, including interference that may cause undesired operation.

Introduction

The Fire GL 2000/3000 is a universal graphics subsystem, specially designed to increase performance and functionality of CAD applications.

Graphics Board Features

- **Fire GL 2000**: 3DLabs GLiNT 300SX rendering processor
- **Fire GL 3000**: 3DLabs GLiNT 500TX rendering processor

- ALG2564 VGA controller with 1 MB DRAM.
- 3DLabs Delta PCI Bridge and Setup Engine
- 2 x 220 MHz pixel-frequency (RAMDAC), 15-pin video output
- 64-bit hyperpipelined architecture
- Proprietary DualScreen Circuitry
- PCI 2.x-Bus compatible
- Mini-DIN external VGA input connector
- 4 MB VRAM local memory
- Memory modules - 4 MB VRAM plus 8 MB, 16 MB, 32 MB DRAM - optional for 3D rendering solutions

Software for Your Board

Supplied with your board are the necessary drivers and software for

- SingleScreen and DualScreen support
- Windows NT 3.51/4.0 and Windows 95 support
- BigFocus displaylist driver for AutoCAD 13
- 3D-Win - 3D Viewer for AutoCAD 13

Troubleshooting

Your board is a complex electronic device and can only be repaired by authorized technical personnel with the required equipment. Do not attempt to change or repair any parts of this product. Doing so will render your warranty invalid.
For the latest troubleshooting tips from the DIAMOND ExpertLine see the section *If You Need Help* at the end of this manual.

Two Graphics Controllers - How does it Work ?

PC´s normally reserve a specific area in memory for graphics/VGA data. That means that the system's processor can only address one graphics controller. A second graphics controller can be addressed by corresponding driver software that does not use the standard VGA address space. Special modules of the dual screen drivers control the secondary graphics controller. During the boot procedure the system uses the standard VGA controller (output only to the primary display) and the second graphics controller is inactive. That's why only the primary monitor displays the boot messages. After the booting procedure the second graphics controller with its output to both monitors takes over control of the graphics system.
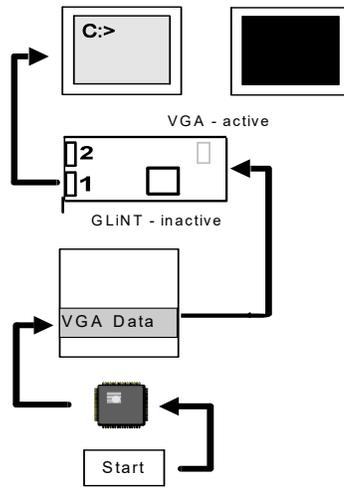
VGA Booting procedure
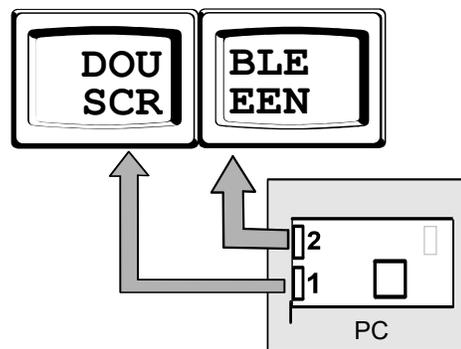
Double Screen Operation

Hardware Installation

Requirements

1. IBM compatible computer (80486/Pentium) with PCI version 2.x bus system.
2. One free PCI bus system expansion slot.
3. Windows® 95 or Windows NT operating system.
4. Screwdriver

Warning!   Prevent static electric damage. Static charges can cause severe damage to microcircuits, but here are some easy ways to see that it doesn't happen:

Hold the graphics card by its edges only. Don't touch edge connectors or exposed circuitry.
Leave the graphics card in the anti-static protective bag until ready to install it in your computer.
If possible, ground your body when handling the card. The metal power supply housing is generally considered the best place to ground yourself.
Do not place the graphics card on a metal surface.
Make the least possible movement to avoid building up static electricity from your clothing, carpets and furniture.

Monitor Compatibility

This board offers high performance in resolutions, refresh rates and colors. Especially the ergonomic refresh rates up to 100 Hz give absolutely flicker-free performance. The board is optimally configured to be combined with high-resolution MultiSync monitors.
Of course the board can also be connected to other VGA monitors. Please be aware of the fact that you can only get use of the full power of the graphics board if the horizontal (kHz) and vertical (Hz) refresh rates of your monitor are as high as required by the graphics board.

Example: The technical specifications of a MultiSync monitor could be as follows: max. resolution 1280 x 1024; max. horizontal frequency 50 kHz; max. vertical frequency (refresh rate) 90 Hz.
If you wish to use one of the video modes listed in the file BIOS.TXT included with this product, then all three of the above mentioned parameters may not exceed the specifications of this monitor.
In our example, the mode 1024 x 768 with a horizontal frequency of 48.5 kHz and a refresh rate of 60 Hz may be selected, whereas the next higher refresh rate of 70 Hz (at the same resolution) is not possible, as the required horizontal frequency is 56.5 kHz in this case, which exceeds the specifications of the monitor.

Warning!   If you permanently operate your monitor at frequencies higher than those for which it is designed, you may damage the monitor.

Before you start to change the refresh rate, check your monitor manual for its technical data (horizontal and vertical refresh rate, possible resolutions).

Set your monitor to analog mode. You may need a new cable or a 9- to 15-pin cable adapter to use this mode.
Check your monitor owner's manual for further information.

Typical System Configuration

A typical configuration environment for your board is described as follows:

- Pentium Tower, PCI bus, 100 MHz (or higher), 16 MB RAM, 4-speed CD drive
- 2 MultiSync Monitors

Preparing your Computer

Please note, that the applications you want to install drivers for have to be already completely installed (for Standard VGA - 640 x 480) on your system prior to using the software. It is a good idea to do this before removing an existing graphics adapter as not every application permits the configuration of the video mode used from the DOS level.

Checking for Existing Graphics / VGA Controllers

Refer to your motherboard or PC manual to find out if you have a system with a EGA/VGA display adapter built into the motherboard. If this is the case, disable the EGA/VGA display adapter before installing the new card.
Please check your PC manual to find the location of the corresponding switch.

Note: If you cannot disable a built-in EGA/VGA adapter in your computer, you must disable the VGA controller on your new Fire GL 2000/3000 card: Set the jumper JP2 to pins 2 and 3. When the new card is installed, connect the VGA loop cable between the VGA connector on the motherboard and the mini-DIN connector on the Fire GL 2000/3000 card

Changing your PC's BIOS SETUP

If another graphics/VGA board was previously installed, it is necessary to change the PC's hardware configuration. This is sometimes done by changing a jumper on the motherboard after removing the old board (check your motherboard or PC manual) although it is more common to change your PC's BIOS SETUP. Check your PC manual for information on its BIOS SETUP.

Warning!   Simultaneously using two active VGA/EGA units in one PC will inevitably lead to system failure!

If your system doesn't have to be re-jumpered for a VGA board then first proceed with the following installation steps and then run your BIOS SETUP program and select 'VGA' (else 'IBM VGA') as your graphics board type. Check your PC manual for information on its BIOS SETUP.

Opening the Computer Cabinet

1. Switch off your computer and all external options (printer, display, and others) and unplug all power cables from the electrical source.
2. Remove the cover mounting screws and save them for later.
3. Remove the cover of the computer.

Preparing the Fire GL 2000/3000 Card
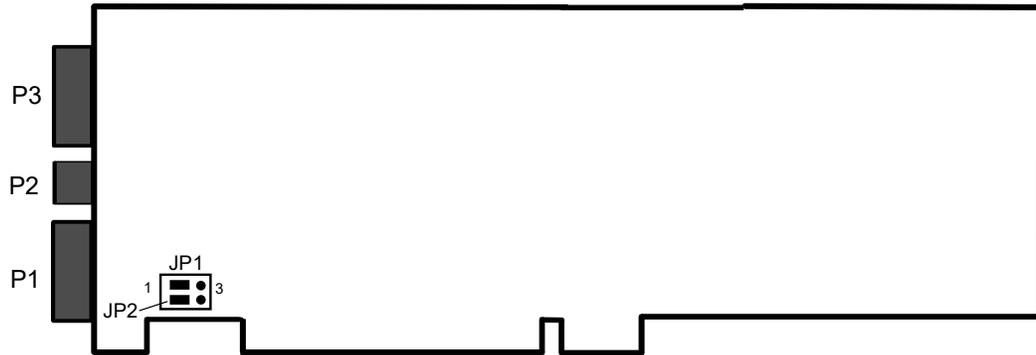
P1:   First or only monitor - 15-pin Sub-D
P2:   External VGA input - 8-pin Mini-DIN
P3:   Second monitor - 15-pin Sub-D
JP1:   Windows95 compatibility enable/disable
JP2:   On-board VGA enable/disable

Make sure that the jumpers on the card are set according to your system configuration.

| Jumper	Pins 1-2	Pins 2-3
JP1	Windows95 compatibility enabled required if you start your system with the Windows95 operating system	Windows95 compatibility disabled
JP2	On board VGA enabled	On-board VGA disabled required only if you cannot remove or disable a VGA/EGA controller already present in your system
Default Setting: Pins 1 and 2 jumpered for JP1 and JP2		

Installing the Board

Install the board in a PCI expansion slot.

1. Select a free expansion slot and remove its metal slot cover. Save the screw to secure the graphics card later.
2. Hold the card by the edges and press it firmly into the expansion slot.
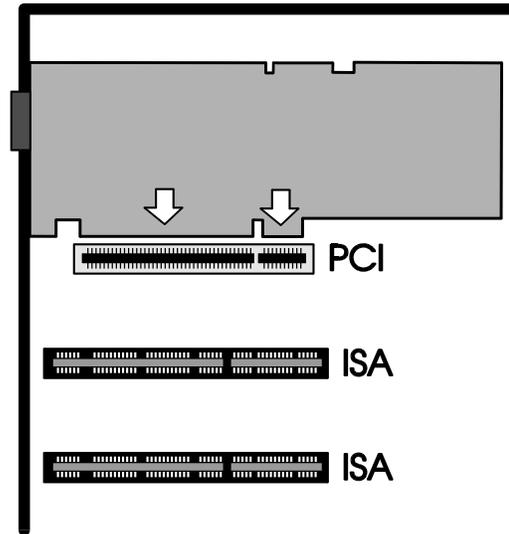
Installation in a PCI expansion slot

Note	The following step is very important in order to ground your graphics card properly.

3. Align the slot in the mounting bracket of the card with the screw hole in the rear panel of the computer case. Use the screw you removed from the expansion slot cover or the previously installed video adapter to secure the card in place.
4. Check if you have any co-resident graphics adapters built into the motherboard. Watch the information in *Checking for Existing Graphics / VGA Controllers* if you have a co-resident graphics adapter.
5. Secure ribbon cables and gently push them down and out of the way before you replace the system cover.
6. Replace the computer cover. Secure it with the screws you removed earlier.
7. Reconnect any peripheral equipment cables you may have disconnected.
8. Securely attach your monitor cables to the 15-pin VGA output connectors on the board. The other end is hooked up to the monitor as described in the manual of the monitor manufacturer.

Note	For a single monitor configuration, connect your monitor to the lower VGA connector (P1) on the board.

9. If you have disabled the on-board VGA controller with jumper JP2, connect the VGA loop cable between the VGA connector on the PC's motherboard and the mini-DIN connector on the Fire GL 2000 card.

Additional Instructions

Please switch on your monitor(s) before you switch on your computer. Doing it the other way around could damage your monitor(s).

Note that your monitor is running in standard modes and that higher refresh rates etc. are not available at this stage of the installation! It is necessary to run tuning programs, or tuning utilities of the operating system, in order to optimize the board's output signals for use with specific monitors.

The board has been designed to 'plug & play' without any modifications being made to the default switch or jumper settings. If however, it appears that the card is not performing optimally, you can change the settings. Refer to the section *Technical Details* for more information.

Resolving Interrupt Conflicts

To support the special graphics processor on the Fire GL 2000/3000 the system BIOS will automatically assign a system interrupt to the PCI slot where the Fire GL 2000/3000 is installed. However, there may be problems if a system interrupt is used for more than one device. In case of problems

- check your computer´s BIOS SETUP for the interrupt assignments. Refer to your PC manual for information on its BIOS SETUP and if possible
  - change the interrupt assignment for the Fire GL 2000/3000, or
  - change the interrupt assignment for any other device sharing the interrupt with the Fire GL 2000/3000

- try to manually change the interrupt assignment for any other device sharing the interrupt with the Fire GL 2000/3000. Check the documentation supplied with these devices for information on hardware switches for interrupt setting.

Hardware Compatibility: the PCI Bus and the Graphics Board

The functionality of a graphics system depends mainly on two components: the graphics board and the mainboard.
If the design of the PCI mainboard is not compliant with the approved PCI specifications you could experience problems with the graphics board.

The board has been tested successfully in PCI bus mainboards with a clock rate of 100 MHz and higher.

After Installing the Board

If you have correctly installed the board, the DOS messages will then appear on your monitor when the boot procedure is finished.
If your system does NOT boot as it should,

- check again to see that the installation instructions were properly followed,
- check for interrrupt conflicts - see *Resolving Interrupt Conflicts*, or
- refer to the section titled *If you need Help.*

Windows NT - Software Installation

In order to use your board in your PC it is necessary to install a package of basic programs, regardless of the operating system you use

Put the CD in drive E: and start the installation (from E:) as follows:

1. **Windows NT 3.5x:** Start the Program Manager, select 'File' - 'Run', then START.EXE from the root directory of the CD.
    Windows NT 4.0: Click on the START button in the task bar, select the option 'Run' and then select START.EXE from the root directory of the CD.

2. Choose English (E) as your language for the installation.

3. Click on the Start Installation button.

4. If necessary, select the hardware for which you wish to install; this is displayed in the Product drop-down list. The installation program usually recognizes your hardware automatically.

5. Click on the Next button.

6. If desired, enter a path to which the software will be installed.

7. Click on the button corresponding to the type of installation you want. If you select Custom, a list of software components will be displayed. Click on the check boxes to specify the components you want to install.

8. A README file will be displayed. Please read this file!

9. After you have read the README, click on Next.

10. Restart the system to enable the new driver installation.

Windows NT 3.5x

11. Select Display in the Control Panel window. Set resolution, color depth, and refresh rate that best meets your requirements and the performance of your monitor(s).

Note:	If you have different types of monitors connected, make sure to select a setting which does not exceed the specifications of the monitor with the lower performance. Check the documentation supplied with your monitor(s) for further information.

12. Click on OK.

Windows NT 4.0

11. Click `Start` - `Settings` - `Control Panel` - `Display` - `Settings`, or click with the right mouse button on the Windows desktop, select `Properties` and `Settings`. Set resolution, color depth, and refresh rate that best meets your requirements and your monitors' performance.

Note:	If you have different types of monitors connected, make sure to select a setting which does not exceed the specifications of the monitor with the lower performance. Check the documentation supplied with your monitor(s) for further information.

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12. Click on `OK`.

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Windows NT 3.5x / Windows NT 4.0

The basic software is now installed. You can see the new `Fire GL 2000/3000` icon in the `Control Panel` window.

To install and configure the drivers you need for the different operating systems and applications you are using, please read the relevant sections that follow.
To adjust the settings for your double-screen configuration, see the section on *'DoubleScreen Settings'*.

Windows® 95 - Software Installation

In order to use your board in your PC it is necessary to install a package of basic programs, regardless of the operating system you use

Put the CD in drive E: and start the installation (from E:) as follows:

1. In the automatically displayed `New Hardware Found` menu, select `Driver from disk provided by hardware manufacturer`. Click on `OK`.
2. Enter 'E:\DRIVERS\' as source of the files and click on `OK`. The installation program will automatically copy all the necessary files onto your hard disk.
3. Restart the system to enable the new driver installation.
4. Click `Start` - `Settings` - `Control Panel` - `Display` - `Settings`, or, click with the right mouse button on the Windows desktop, select `Properties` and `Settings`. Set resolution, color depth, and refresh rate that best meets your requirements and the performance of your monitor(s).

Note:	If you have different types of monitors connected, make sure to select a setting which does not exceed the specifications of the monitor with the lower performance. Check the documentation supplied with your monitor(s) for further information.

5. Click on `OK`.

The basic software is now installed. You can see the new `Fire GL 2000/3000` icon in the `Control Panel` window.
To install and configure the drivers you need for the different operating systems and applications you are using, please read the relevant sections that follow.
To adjust the settings for your double-screen configuration, see the section on '*DoubleScreen Settings'.*

DoubleScreen and Configuration Settings

Configuring a Windows NT 3.5x System

Double-click on the `Fire GL 2000/3000` icon in the `Control Panel` window to display the `DoubleScreen Settings` menu.

FullScreen
Select if you want the full screen display only on the `Current monitor` - that is the monitor where your mouse cursor currently is, or split `on both` monitors.

Reports
Select if you want Windows messages that normally display in the center of the screen shown on the `left` or `right` monitor. This keeps the screen area of the other monitor free for your work.

Fire GL 2000/3000 Configuration

Click on this button to display a menu with the following options:

- Boot Time Configuration Parameters
- Dynamic Configuration Parameters
- Boot Time Buffer Size Options
- Dynamic Buffer Options
- Dynamic Texture Configuration
- Gamma Correction Adjustment

If you experience problems with your application, or if you want to try to optimize the performance of your system on specific applications, you may modify the `Fire GL 2000/3000 Configuration` settings.

Notes: Only experienced users should modify the `Fire GL 2000/3000 Configuration` settings. Refer to *Configuration Parameters* for more details.

The configuration default settings typically require modification only for

- diagnostic purposes

- fine-tuning a specific application/system configuration

- specific settings recommended by your hardware or software documentation

- tuning your application/system environment to best performance and memory usage

Configuring a Windows95 / Windows NT 4.x System

Click `Start` - `Settings` - `Control Panel` - `Display,` or click with the right mouse button on the Windows desktop and select `Properties.`

Monitor

Select this tab for the following settings:

FullScreen
Select if you want the full screen display only on the `Current monitor` - that is the monitor where your mouse cursor currently is, or split `on both` monitors.

Reports
Select if you want Windows messages that normally display in the center of the screen shown on the `left` or `right` monitor. This keeps the screen area of the other monitor free for your work.

Gamma Correction Adjustment
Adjust the gamma correction for optimal brightness of your screen display.

Configuration

Select this tab to display a menu with the following options:

- Boot Time Configuration Params
- Dynamic Configuration Params
- Dynamic Texture Configuration

DMA Buffers

Select this tab to display a menu with the following options:

- Boot Time Buffer Size Options
- Dynamic Buffer Options

Notes: If you experience problems with your application, or if you want to try to optimize the performance of your system on specific applications, you may modify the `Configuration` and `DMA Buffers` settings.

Only experienced users should modify the the `Configuration` and `DMA Buffers` settings. Refer to *Configuration Parameters* for more details.

The configuration default settings typically require modification only for
- diagnostic purposes
- fine-tuning a specific application/system configuration
- specific settings recommended by your hardware or software documentation
- tuning your application/system environment to best performance and memory usage

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Configuration Parameters

- Boot Time Configuration Parameters
  - Enable Multiple 4096 Double-Buffered Windows
  Tick this checkbox to allow multiple double buffered windows simultaneously in 4096 color mode. This may be useful for some applications.
  - Export 'PDF_SUPPORT_GDI' modes
  These checkboxes control whether the 'PDF_SUPPORT_GDI' flags are exported for single buffered and double buffered pixel formats.
  - Export High Resolution, Single Buffered Formats
  Check this box to enable the driver to boot at resolutions where only single buffered pixel formats are supported by GLINT acceleration (because at higher resolutions, there is not enough VRAM to support double buffered formats). By default, this is disabled to prevent users from booting into a mode that will result in unaccelerated applications that use double buffered modes.
  - SoftImage version 3.01/3.51 specific support
  Check the appropriate box to ensure correct operation of your version of SoftImage. Support for version 3.51 excludes support for version 3.01.
  - Use BIOS PCI base addresses
  Check this box to use the originally configured PCI BIOS base addresses rather than those configured by NT HAL for addressing the graphics card. For some hardware configurations the NT HAL allocated PCI base addresses are not valid.

- Dynamic Configuration Parameters
  - Disable Fast Clear Planes
  Check this box to disable the use of Depth Clear planes. Use this option when the Depth buffer needs to be read back into the application.
  - Disable Delta
  Check this box to prevent the Delta triangle setup chip from being used. This is useful for performance comparison.
  - Draw Line Endpoints
  Setting this option may improve the legibility of text rendered by some applications using stroke fonts, for example, ProEngineer.

- Dynamic Texture Configuration
  - Force Nearest Neighbour Filtering
    This setting ensures that only nearest neighbour texturing operations are performed. In some applications this improves the performance, although in some cases a lower quality texture filter is used. Textures are still rendered with perspective correction. Check this setting to find out if you can improve the performance/texturing quality ratio with your application.
  - Enable Texture Compression
    This option will shrink 2D texture maps as they are loaded to reduce the memory needed to store them. The setting has no effect on 1D or paletted texture maps. This setting applies to all hardware configurations.
  - Use High Quality Texture (GLiNT 300SX/Fire GL 2000 only)
    Check this box if, for example, the texture in your application shows artifacts. This may indicate that the dynamic range of the default texturing code method is not sufficient for your application. Tick the checkbox to switch to a slower mechanism for the texturing code which has a greater dynamic range.
  - Disable Mip Mapping (GLiNT 500TX/Fire GL 3000 only)
    This option will override the mip-map texture filtering settings of your application and enforces faster rendered mip-map filtering.

- Gamma Correction Adjustment

  The gamma correction adjustment affects the entire screen display. The possible setting range is 0.3 - 4.0. The default setting is 1.0.

- Boot Time Buffer Size Options

  Specify the size of a DMA buffer and the number of DMA buffers allocated at boot time. Consider that you need enough buffers for your applications to run smoothly but that each of these buffers uses up system memory.

- Dynamic Buffer Options

  Each buffer is divided into sub-buffers which are used in conjunction with an Interrupt DMA mechanism to reduce latency in the system. Setting the number of sub-buffers to 2 will disable the interrupt mechanism.

3D-Win

3D-Win is a simple to use 3D viewer for users of AutoCAD with a number of attractive features. You can modify your AutoCAD design via various functions by clicking on
3D-Win icons. For example, you can change the camera position, make different shadings, for example, Gouraud, or walk through or around an object with the 'Walk' command.

- Simple, fast viewing angle changes
- Zoom views
- Fast import of DWG designs (if Autodesk compatible)
- Layer manipulation
- Various rendering methods (e.g. Gouraud) per mouse click
- View manipulation per slider or mouse
- View export to AutoCAD
- WALK and TEACH animations
- Animation recording - AVI
- Integrated toolbar for fast function access
- Online help

Notes: You need AutoCAD r13 for Windows NT installed on your system to use 3D-Win. The current version of 3D-Win is designed only for the Windows NT (3.51 and higher) operating system.

Installation

Note: You must have already installed the basic software from the CD before continuing.

1. Double-click on the icon 'Display Component Setup' in the DIAMOND program group.
2. Select Add component and 3D-Win.
3. Click on OK. The installation program will automatically copy all the necessary files onto your hard disk.
4. When 3D-Win has finished installing, you can find the 3D-Win icon in the DIAMOND program group.

Using 3D-Win

1. Run AutoCAD r13 and load the file you want to see or render.
2. From the Program Manager double-click on the 3D-Win icon in the DIAMOND program group.
3. In the 3D-Win window select Get Model from the AutoCAD menu to load the file into 3D-Win.

   3D-Win is virtually self-explanatory. If you have problems with some of the dialog boxes, or don't understand certain system reactions, check the online help for information and details. You can access the online help with the respective Help button in a dialog or the Help button in the menubar.

AutoCAD for Windows - BigFocus Driver

The BigFocus driver is supplied for use with AutoCAD 13 running under Windows 95 or Windows NT. The driver allows view and layer manipulation, spyglass lens, bird's-eye view and view export.

Using BigFocus is self-explanatory but if you should need further information, consult the integrated online help and/or the separate BigFocus documentation.

BigFocus Installation

Note: You must have already installed the basic software from the CD before continuing.

If you have the `Display Component Setup` icon in the `DIAMOND` program group ...

1. Double-click on the icon `Display Component Setup` in the DIAMOND program group.
2. Select `Add component` and `BigFocus`.
3. Click on `OK`. The installation program will automatically copy all the necessary files onto your hard disk.

If you do not have the `Display Component Setup` icon ...

Put the CD in drive E: and start the installation (from E:) as follows:

1. **Windows NT 3.5x**: Start the Program Manager, select `File - Run`, then START.EXE from the root directory of the CD.
   Windows 95 / Windows NT 4.0: Click on the START button in the task bar, select the option `'Run'` and then select START.EXE from the root directory of the CD.
2. Choose `English (E)` as your language for the installation.
3. The main menu is displayed.
4. Click on the `Start Installation` button.
5. Confirm your hardware if necessary.
6. Select `Custom` installation, and enter or confirm the path for the software installation.
7. Click the `Next` button
8. Select `BigFocus` from the list and follow the instructions on the screen. The installation program will automatically copy all the necessary files onto your hard disk.

Note: An important file will also be created on your hard disk: DSBIGFOC.INI DSBIGFOC.INI contains an important entry that you may need to change to accommodate for your hardware. See the 'Troubleshooting' section of the BigFocus online help for more information.

Reconfiguring AutoCAD for Windows to use BigFocus:

1. Start ACADWIN, Select "`Options`", "`Configure`", and when selecting the display driver choose:
   `BigFocus - Accelerated Display Driver.`
2. Save your changes.

Technical Details

Technical Data

Processors: Fire GL 2000: 300SX (3DLabs), ALG2564 (VGA)
    Fire GL 3000: 500TX (3DLabs), ALG2564 (VGA)
4 MB VRAM
1 MB DRAM (VGA)
Optional memory modules   Fire GL 2000: 4 MB VRAM plus 8 MB or 16 MB DRAM
    Fire GL 3000: 4 MB VRAM plus 16 MB or 32 MB DRAM

Video Modes
In double screen mode, the effective screen resolution is twice the horizontal single screen resolution, for example, 1024x768 in single screen mode corresponds to 2048x768 in dual screen mode.

Resolution	Color Depth in bits (both screens)	Refresh Rate in Hz	
		Single Screen	DualScreen
640 x 480	32	60 - 100	60 - 100
800 x 600	32	75 - 100	75
1024 x 768	8, 16, (32)	75 - 100	75 - 100
1152 x 870	8, 16, (32)	75 - 85	75 - 85
1280 x 1024	8, (16)	75 - 100	75 - 100
1600 x 1200	8, (16)	75 - 85	75 - 85
( ) = additional single screen rating			

HighColor (65,536 simultaneous colors) - 16 bit
TrueColor (16.7 mill. simultaneous colors) - 32 bit

Jumpers

The FIRE GL 2000/3000 has **two** jumpers.

Jumper	Pins 1-2	Pins 2-3
JP1	Windows95 compatibility enabled required if you start your system with the Windows95 operating system	Windows95 compatibility disabled
JP2	On board VGA enabled	On-board VGA disabled required only if you cannot remove or disable a VGA/EGA controller already present in your system
Default Setting: Pins 1 and 2 jumpered for JP1 and JP2		

Memory Extension

Necessity of Memory Extension
Your FIRE GL 2000/3000 is fitted with 4 MB VRAM. This memory size is adequate for many applications on the market. Please note that double-screen operation generally requires more video memory, although extending the memory does not automatically mean that you have access to higher resolutions, faster refresh rates or higher color depths. However, if you want or need 3D capabillity, or double buffering for 3D applications, the memory extension of the FIRE GL 2000/3000 is required.

Extending Memory
Optional memory modules (piggyback boards) are available.

Fire GL 2000: 4 MB VRAM plus 8 MB or 16 MB DRAM
Fire GL 3000: 4 MB VRAM plus 16 MB or 32 MB DRAM

If you wish to extend your board's memory, then please contact your local distributor.

Memory Addresses

It is necessary to make sure that all I/O and memory addresses reserved for the graphics board are not used by other hardware devices.

If the on-board VGA controller of your Fire GL 2000/3000 is active, your board uses the following addresses:

I/O address:
    Standard VGA I/O   3B0-3DF

Memory addresses:
    Video RAM   A000-BFFF
    Video ROM   C000-C7FF

VGA Output Connectors

Pin Function
1   Red
2   Green
3   Blue
4   Not used
5   ground
6   Red Return (ground)
7   Green Return (ground)
8   Blue Return (ground)
9   Key (no pin)
10   Sync Return (ground)
11   not used
12   DDC 0
13   Horizontal Sync (+)
14   Vertical Sync (-)
15   DDC 1
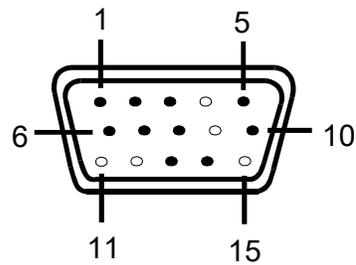
Pinning of the 15-pin Sub-D VGA Output

External VGA Input Connector

Pin Function
1   EXT RED
2   EXT GREEN
3   EXT BLUE
4   GROUND
5   EXT HSYNC
6   EXT VSYNC
7   EXT DQ0
8   EXT DQ1
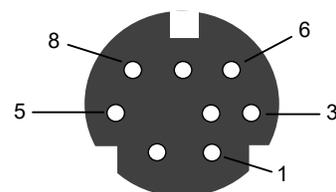
Pinning of the 8-pin Mini-DIN External VGA Input

If You Need Help

Your documentation and the README files provide tips and suggestions to help you, should you encounter problems or have questions regarding the use of your Diamond product.

Additional technical support is available from the extensive information and support services offered by the Diamond Technical Support Team Europe. Further information is available from our company headquarters in the USA. Below is a brief description of our European support services and how you can take advantage of them. We also provide an overview of our worldwide information services.

In order for us to service your inquiries to the best of our ability, please be prepared to provide the following information when you contact Diamond for technical support:

- The exact designation of your Diamond Multimedia product
- The operating system you are using, as well as information about the computing environment in which you use your product
- For graphics and video cards, the card's BIOS version
- For modem products, result codes from the I3 command (if possible)
- Names and version numbers of the Diamond drivers and applications you are using
- Name and version number of the application with which you have encountered problems
- A detailed description of the problem. Please reproduce the problem several times and provide a detailed description of the necessary steps.

Diamond's Online Services:
BBS, CompuServe, Internet

Among other things, you can find the following kinds of information in the Diamond BBS as well as in Diamond's CompuServe forums and Internet services:

- the most current releases of Diamond drivers and software updates;
- optional drivers and programs that aren't standard components of our products;
- tips, hints and technical information prepared and constantly updated by Diamond's support staff--you'll find these under the heading Tips & FAQ's for our Products;
- and a variety of other information.

The online services are available 24 hours every day and provide (technical) information about all aspects of our products. Please consult these sources before calling our hotline. It's quite possible that the answer to your question is already documented in our online services.

Here's where you can reach the online services of Diamond's Technical Support Team Europe:

Diamond BBS

Diamond Germany	+49 - 81 51 - 266 333	Modem, up to 28.8 kBaud
	+49 - 81 51 - 266 334	ISDN
Diamond UK	+44 - 11 89 - 44 44 15	Modem, up to 28.8 kBaud
Diamond France	+44 - 11 89 - 44 44 15	Modem, up to 28.8 kBaud
	+49 - 81 51 - 266 333	Modem, up to 28.8 kBaud
	+49 - 81 51 - 266 334	ISDN

Diamond's CompuServe Forums

GO SPEA	European forum (German language)
GO DIAMOND	US forum (English)
GO SUPRA	US forum (English), for modem products

Diamond and Internet

World Wide Web

http://www.spea.com	European WWW server (multilingual)
http://www.diamondmm.com	US WWW server (English)
http://www.supra.com	US WWW server (English), for modem products

FTP

ftp.diamondmm.com	US FTP server (English)
ftp.supra.com	US FTP server (English), for modem products

Diamond's Fax-back System

You also have access to a variety of information through our fax-back system. All you need is a touch-tone phone to select documents such as:

- technical tips, tricks and suggestions, compiled by our support staff;
- answers to frequently asked questions, and
- much more information about Diamond and its products.

Diamond Fax Info Service

The fax-back system is available 24 hours daily at the following numbers:

Diamond Germany   +49 - 81 51 - 266 332
                             Most information is available in German and English.

Diamond UK   in preparation
Diamond France   in preparation

Diamond SuperCD: Driver and Software Updates on CD

Most drivers and software updates are available on the Diamond SuperCD as well as from our online services. This CD is updated at irregular intervals and can be obtained directly from Diamond.
Information on the current version of the SuperCD, including price and order details, is available via the Diamond Fax Info Service, or from our support hotline staff.

Diamond ExpertLine: Technical Support Hotline

We also offer a telephone support hotline to which you can direct questions for which you can't find answers in the documentation and README files or in the online information services. In order for us to service your inquiries to the best of our ability, please be prepared to provide the following information when you contact Diamond for technical support:

- The exact designation of your Diamond Multimedia product
- The operating system you are using, as well as information about the computing environment in which you use your product
- For graphics and video cards, the card's BIOS version
- For modem products, result codes from the I3 command (if possible)
- Names and version numbers of the Diamond drivers and applications you are using
- Name and version number of the application with which you have encountered problems
- A detailed description of the problem. Please reproduce the problem several times and provide a detailed description of the necessary steps.

You can also request information outside of our regular business hours by simply calling our support hotline's regular number from a touch-tone phone. You can access information about how to get software updates, availability of drivers and so on, or you can request that such information be faxed to you via our fax-back system.

Diamond ExpertLine - Technical Support Hotline

Here are the telephone numbers for the support hotline:

Diamond Germany +49 - 81 51 - 26 63 30   German support
                 Monday - Friday   09:00 - 12:00
                 Monday - Thursday 13:00 - 16:00

Diamond UK   +44 - 11 89 - 44 44 44   English support
                 Monday - Friday 08:30 - 17:30

                 +44 - 11 89 - 44 44 33   French support
                 Monday - Friday 08:30 - 17:30

E-mail:

Diamond Germany   via GO SPEA in CompuServe

Diamond UK   100632.1252@compuserve.com

Diamond WorldWide: Support Services in the USA

In addition to the European services described above, a number of information services are available from the support staff at Diamond in the USA. These include:

Diamond Multimedia Inc., USA

BBS	+1 - 408 - 325 - 7080	up to 2.400 Baud
	+1 - 408 - 325 - 7175	up to 14.400 Baud

CompuServe	GO DIAMOND	
America Online	DIAMOND	
Internet	http://www.diamondmm.com	World Wide Web
	ftp.diamondmm.com	FTP
Support hotline	+1 - 408 - 325 - 7100	
Tech support fax	+1 - 408 - 325 - 7171	

Diamond Communications Division USA

BBS	+1 - 541 - 967 - 2444	
CompuServe	GO SUPRA	
America Online	SupraCorp2	e-mail
FidoNet	SupraCorp	Echo-Mail
Genie	SupraTech	e-mail
Internet	supratech@supra.com	General support
	intltech@supra.com	International support
	http://www.supra.com	World Wide Web
	ftp.supra.com FTP	
Fax-back system	+1 - 541 - 967 - 0072	
Support hotline	+1 - 541 - 967 - 2490	PC
	+1 - 541 - 967 - 2491	Windows
	+1 - 541 - 967 - 2492	Macintosh
Fax	+1 - 541 - 967 - 2401	

Diamond Support Services in Japan

Support hotline	+81-3-5695-8405	Voice Support
	Monday - Friday 10.00am - 12.00pm	
	Monday - Friday 1.00pm - 4.00pm	
Tech support fax	+81-3-5695-8403	
NIFTY-Serve:	KYB02015	

Hardware Service

DIAMOND products are subjected to intensive tests and fulfill the highest quality standards. Nevertheless, you have the benefit of additional security with an extended guarantee for graphics boards. In the unlikely event of your needing to use your guarantee, please contact your local distributor or retailer for help and advice.

Glossary

Analog Display
A 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.

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

Authoring Systems
Authoring systems are used to create multimedia applications. They combine existing presentation information (texts, images and sound) and control the flow of these during the multimedia show. The dialogue with the user is controlled with this software. The individual information must have already been created and saved with special programs.

AUTOEXEC.BAT
A batch file that directs the activities performed by the computer during system startup.

AVI
Audio **V**ideo **I**nterleaved. AVI files are the standard format for digital video films on Pcs.

Bandwidth
The 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.

BitBLT
Bit Block Transfer refers to the ability of a system to move pixel blocks (in a rectangular area, e.g. in a window) very quickly. The contents of the rectangular area are rapidly refilled with the original contents.

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.

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
The 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'.

CD-I
Compact **D**isc **I**nteractive. A technique developed by Philips in order to playback games, films and music videos on a CDI player.

CD-ROM
High-density medium to store digital data. CD-ROMs have read-only status. There are different CD-ROM formats:
YellowBook: conventional CD-ROM format
GreenBook: used for linear video, this is typical for CD-I's (see below)
WhiteBook: used for Digital Video VideoCDs.

CGA

The IBM Color Graphics Adapter.

Channel Number

A MIDI device can have three connections - MIDI-In, MIDI-Out and MIDI-Through. The last is used to pass on data group information without changing it. This enables the user to cascade several devices. To select a particular device, the MIDI information is passed on to an identifying channel number from 1 to 16.

Cinepak

Software-Codec. Makes fast decoding possible. Good image quality possible as long as the image dimensions are not increased. The video encoding process is time-consuming.

CODEC

Compressor / Decompressor, responsible for the compression and decompression of image data.

Color Display

A 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.

Color Palette Conversion

Conversion of video data from the YUV color model into the RGB color model, or v.v.

CONFIG.SYS

An ASCII file that is created to provide the computer with special information about applications and hardware.

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.

Data Transfer Rate

The data transfer rate describes the amount of data transferred to or from the storage medium (e.g. hard disk) per second. Each data storage medium has a specific data transfer rate which it can handle. Typical values are:
- old hard disks 300 KB/s
- new hard disks 600 KB/s
- standard CD-ROM drives 150 KB/s
- DoubleSpeed CD-ROM drives 300 KB/s

DCI

Display **C**ontrol **I**nterface. An interface defined by the Intel and Microsoft corporations, which enables enhanced graphics performance due to direct access to the video memory.

Default Mode

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

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.

Digital Video

Digital videos contain optical information bitwise in a file.

DIP Switch
Dual Inline Package switch; a series of tiny, two position switches which allow users to select and change options on computer boards, printers, and other peripherals.

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.

Dropped Frames
The images of a video which are not displayed or recorded when replaying (resp. recording).

EEPROM
Electrically eraseable programmable read only memory; used to replace DIP switches and jumpers on new graphics boards like yours.

EGA
The IBM Enhanced Graphics Adapter.

EMS
Enhanced Memory Specification. Originally developed to break the DOS 640K limit, it is now used as a general term for types of add-in memory.

Enhanced Color Display (ECD)
The IBM Enhanced Color Display capable of 640 x 350 resolution.

EPS (Encapsulated PostScript)
EPS is a device-independent file format, which contains all the information required to reproduce an image directly on a PostScript printer or to use it in suitable applications. A small header section contains the data of the image as a TIFF-format file so that applications that can not display PostScript data directly can still obtain an impression of the file contents.

Expansion Board
A device used to expand a computer's capability.

Expansion Slot
An electrical connection within the computer used for the addition of Expansion Boards.

Fill-in Images
When video data is being saved onto a CD-ROM (during manufacturing) the images are normally 'polstered' with fill-in images so that each video file completely uses the assigned 2KB area. This ensures a constant data rate and a smoother playback appearance. The file size is not changed by doing this.

Fixed Frequency Monitor
An analog monitor which can only sync to a very narrow range of scan frequencies.

fps
frames **p**er **s**econd. 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.

Framegrabber
If an overlay board (see below) also contains a realtime video digitizer (= frame grabber), then the user can capture a random frame from the video sequence being replayed and can save this onto his hard disk.

General MIDI
The MIDI Association's MIDI Song File standard has established itself as the General MIDI standard for the exchange of MIDI music data between different PC systems.

GIF (Graphics Interchange Format)
A graphics file format developed by CompuServe to enable the device-independent exchange of images between systems. GIF-format files can be up to 64MB in size with color information up to 256 colors (8 bits). GIF files do not contain information about the image resolution.

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

Hardware Cursor
The cursor's movements and display are controlled by the accelerator chip. This means that the CPU only has to pass the mouse co-ordinates to the graphics board, reducing the CPU's workload.

Hercules Graphics Card (HGC)
A 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.

Horizontal Frequency
The rate at which a monitor displays each scan line. Usually measured in kilohertz (kHz).

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

Image Compression
Technique used to reduce the volume of data in digital image and video files.

INDEO
Intel Vi**deo**. Compression technique developed by Intel. Gives good quality but requires a high level of processing work to decompress.

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 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

A monitor that refreshes every other scan line every other pass of the screen. A non-interlaced monitor refreshes the entire screen (every scan line) every pass of the screen.

Interleave

A technique used to organize audio and video data so that every audio data segment is followed by video data, e.g. AVAVAV.....

Interrupt Request (IRQ)

Signal used by a device, such as a mouse, to inform the CPU that it is present and functioning.

JPEG

A new compressed file format industry standard developed by the Joint Photographic Experts Group. It enables compression ratios up to 100:1 (original file size to compressed file size). A new feature of this standard is that it is device-independent. These files can be replayed using any application that supports this format. JPEG differs from the LZW compression method in that it works without quality loss. This means that some of the original data is lost during the compression phase. In order to surpass this visual effect JPEG compression attempts to 'lose' information which is less important to the human eye. Use this format if you don't have much memory space available or if you are processing very large image files.

Jumper

A 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.

Keyframe

Technique used to compress video data whereby certain frames are defined as 'keyframes' and are fully saved during compression. The video data of the frames between two keyframes are only partially stored. During decompression the 'partial frames' use the information stored in the keyframes.

Line Drawing

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

M-JPEG

Motion **JPEG**. A codec (see above), which is especially suited to video processing. Hardware decompression is strongly recommendable for this.

MDA

The IBM Monochrome Display Adapter.

MIDI

Musical **I**nstrument **D**igital **I**nterface. A serial interface used to link computers, synthesizers and other electronic sound generating devices.

Monochrome Display

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

MPC

Multimedia **PC**. This trademark is intended to help consumers when purchasing hardware and software (similar to the VHS symbol used in the video product market).

MPEG

Motion **P**icture **E**xpert **G**roup. The compression method known as MPEG 1 is suited to digital video playback. A hardware decompressor is necessary.

MPEG

MPEG stands for Motion Pictures Experts Group, a group of the ISO committee for standards. With the MPEG format an international standard for the display of 25 images per second and a transmission rate of between 150 and 300 KByte per second is defined. Through a highly sophisticated compression method MPEG is a way to display full screen and full motion video with CD sound quality using little memory. This way, MPEG files can be played back as well as Video CDs, interactive programs and presentations.

MT-32

The MIDI module MT-32 created by Roland.

Multi-frequency Monitor

A 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.

NTSC

National **T**elevision **S**tandards **C**ommittee. The committee responsible for the definition of the North American television standard (with the same name). NTSC creates 30 images per second.

Overlay Boards

Overlay boards are able to digitize video images being input in realtime, to synchronize the data with the random segment of the screen and to show both images (incoming video signal and background screen image) simultaneously on the PC's monitor. The result is a window showing a video film which is placed over a background (e.g. a Windows application).

PAL

Phase **A**lternation **L**ine. PAL is the television standard used in Germany and Great Britain. The video signals are transformed into 25 images per second.

Palette

A 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.

PCX (PC Paintbrush)

This file format was developed by Zsoft Corporation for PC Paintbrush, one of the first computer drawing programs. It is the standard format for many scanners and drawing programs. Some versions of the PCX format don't contain any information about the resolution of the image.

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.

Polygon Fill

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

Primary Display
The monitor that is active when you power on your system.

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

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

Resolution
The number of pixels (from picture cells) in both horizontal and vertical directions.

Resolution
Number of pixels displayed 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.

Sample Frequency
If the data bandwidth is fixed then the incoming signal to a processing unit can be assigned to a whole number (value). The quantity of such values (samples) that can be taken per second is referred to as the sample rate or frequency.

Sampling Depth
Describes the number of bits used for each sampled value of the sound input. 8 bits are suitable for microphone recordings, 16 bits give higher quality but require twice the memory storage space.

Sampling Rate
Analogue acoustic signals are digitized by the analogue/digital converter (ADC) on your sound or video board. The ADC component samples the audio signal in extremely short time intervals and stores the measured values. The number of sampled values per second is the 'sampling rate'. The usual rate for a low-quality recording of speech is 11.025 kHz. Better quality speech recordings or low-quality music recordings are sampled at 22.05 kHz. CD quality is attained at 44.1 kHz.

Saturation

The saturation refers to the 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.

Secondary Display

The monitor connected to the graphics card that is co-resident with another card/monitor in your computer system. Is not active upon booting your system.

Sound Files

The most common file type for sound files under Windows are WAV files.

Sync

The stable condition that 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.

Terminate and Stay Resident (TSR)

Programs that are run once then remain in memory in order to be activated by a sequence of key strokes or a 'hotkey.' It is possible that a TSR may take up too much memory and cause conflicts with other programs.

TGA (Targa)

Developed by the company True Vision especially for its true color video boards (especially the Targa board), this is a format preferred by many specialists.

TIFF (Tagged Image File Format)

This format was developed by Aldus and Microsoft in order to promote the use of desktop scanners and DTP systems. Uncompressed TIFF files are hardware and software-dependent, however there are different incompatible compression methods. Select this format for the maximum compatibility with other applications and to improve the compression level.

TrueColor

The ability to display 16.7 million simultaneous colors. It is believed that the human eye can discern no more than 16.7 million colors. See 'palette'.

Variable Frequency Display (VFD)

A 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

The rate at which the monitor screen is refreshed. Usually measured in hertz (Hz).

VGA

The IBM Video Graphics Adapter.

Video CD

The VideoCD specification was published in 1993 by JVC, Matsushita, Sony and Philips as the so-called 'Whitebook' standard. Using this up to 74 minutes of digital video compressed with the MPEG 1 technique can be stored on a CD. The image resolution is 352 x 240 pixels and 30 frames per second for the NTSC standard and 532 x 288 pixels at 25 fps for PAL.

Video Connector

The standard 15-pin monitor output connector located on the board.

Video Electronics Standards Association (VESA)

industry-wide consortium organized to standardize graphic modes. Your board supports the VESA standards.

Video Keying

This term refers to the process of mixing two video and computer graphics signals.

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.

YUV Signal

A video signal that is comprised of a brightness part (luminescence Y) and two color parts (chrominance U and V). Due to the characteristics of the human eye, it is enough to transfer the color parts with a lower resolution. This mixture is technically achieved by only evaluating 2 chrominance signals U and V compared with the 4 values calculated for the luminescence. This results in statements in the format 4:2:2. Other constellations are possible.

Zooming

Increased display of an image section.